L STAR TABLES

```
0001                    32,3755
0002    REF   1         14,2000
0003                    14,3405

0004    REF   1

0500                    14,3405   15261 0
0500                    14,3406   27231 1
0501                    14,3407   74126 1
0501                    14,3410   61161 0
0502                    14,3411   70032 1
0502                    14,3412   54470 0
0503                    14,3413   15013 1
0503                    14,3414   10432 0
0504                    14,3415   67066 0
0504                    14,3416   40370 1
0505                    14,3417   02550 0
0505                    14,3420   31133 1
0506                    14,3421   07207 0
0506                    14,3422   24243 1
0507                    14,3423   67275 0
0507                    14,3424   67544 0
0508                    14,3425   13261 0
0508                    14,3426   25121 1
0509                    14,3427   05075 0
0509                    14,3430   16350 0
0510                    14,3431   70715 0
0510                    14,3432   55404 1
0511                    14,3433   62486 1
0511                    14,3434   54577 0
0512                    14,3435   10650 0
0512                    14,3436   17202 1
0513                    14,3437   63234 1
0513                    14,3440   43704 0
0514                    14,3441   73710 0
0514                    14,3442   50170 1
0515                    14,3443   07203 1
0515                    14,3444   13612 0
0516                    14,3445   61746 0
0516                    14,3446   77370 0
0517                    14,3447   02343 1
0517                    14,3450   05340 0
0518                    14,3451   03235 0
0518                    14,3452   14762 1
0519                    14,3453   62030 0
0519                    14,3454   51212 1
0520                    14,3455   70715 0
0520                    14,3456   64117 1
0521                    14,3457   01744 1
0521                    14,3460   11157 1
```

```
BANK    32
SETLOC  STARTAB
BANK

COUNT   14/STARS

2DEC    +.8341953207 B-1   STAR 37    X
2DEC    -.2394362567 B-1   STAR 37    Y
2DEC    -.4967780649 B-1   STAR 37    Z
2DEC    +.8138753897 B-1   STAR 36    X
2DEC    -.5559063490 B-1   STAR 36    Y
2DEC    +.1690413589 B-1   STAR 36    Z
2DEC    +.4540570017 B-1   STAR 35    X
2DEC    -.5393383149 B-1   STAR 35    Y
2DEC    +.7091871552 B-1   STAR 35    Z
2DEC    +.3200014224 B-1   STAR 34    X
2DEC    -.4436740480 B-1   STAR 34    Y
2DEC    -.8371095679 B-1   STAR 34    Z
2DEC    +.5518160037 B-1   STAR 33    X
2DEC    -.7934422090 B-1   STAR 33    Y
2DEC    -.2568045150 B-1   STAR 33    Z
2DEC    +.4535361097 B-1   STAR 32    X
2DEC    -.8780537171 B-1   STAR 32    Y
2DEC    +.1527307006 B-1   STAR 32    Z
2DEC    +.2067145272 B-1   STAR 31    X
2DEC    -.8720349419 B-1   STAR 31    Y
2DEC    -.4436486945 B-1   STAR 31    Z
2DEC    +.1216171923 B-1   STAR 30    X
```

L STAR TABLES


```
0522                14,3461  63531 0    2DEC  -.7703014754 B-1  STAR 30   Y
0522                14,3462  66055 1
0523                14,3463  12007 0    2DEC  +.6259751556 B-1  STAR 30   Z
0523                14,3464  37503 0
0524                14,3465  76145 0    2DEC  -.1126265542 B-1  STAR 29   X
0524                14,3466  53477 0
0525                14,3467  60372 1    2DEC  -.9694679589 B-1  STAR 29   Y
0525                14,3470  43624 0
0526                14,3471  03370 0    2DEC  +.2178236347 B-1  STAR 29   Z
0526                14,3472  15121 1
0527                14,3473  76123 0    2DEC  -.1147906312 B-1  STAR 28   X
0527                14,3474  64245 0
0528                14,3475  72437 1    2DEC  -.3399437395 B-1  STAR 28   Y
0528                14,3476  45623 1
0529                14,3477  61041 0    2DEC  -.9334138229 B-1  STAR 28   Z
0529                14,3500  57124 1
0530                14,3501  72275 1    2DEC  -.3518772846 B-1  STAR 27   X
0530                14,3502  55365 1
0531                14,3503  62641 0    2DEC  -.8239967165 B-1  STAR 27   Y
0531                14,3504  72150 0
0532                14,3505  70712 1    2DEC  -.4440853383 B-1  STAR 27   Z
0532                14,3506  41542 1
0533                14,3507  67363 0    2DEC  -.5328042377 B-1  STAR 26   X
0533                14,3510  50441 0
0534                14,3511  64426 0    2DEC  -.7159448596 B-1  STAR 26   Y
0534                14,3512  77263 0
0535                14,3513  07157 0    2DEC  +.4511569595 B-1  STAR 26   Z
0535                14,3514  34056 0
0536                14,3515  63326 0    2DEC  -.7862552143 B-1  STAR 25   X
0536                14,3516  77723 1
0537                14,3517  67516 1    2DEC  -.5216265404 B-1  STAR 25   Y
0537                14,3520  72566 1
0538                14,3521  05231 1    2DEC  +.3312227199 B-1  STAR 25   Z
0538                14,3522  14031 0
0539                14,3523  64753 1    2DEC  -.6899901699 B-1  STAR 24   X
0539                14,3524  63156 0
0540                14,3525  71237 1    2DEC  -.4180817959 B-1  STAR 24   Y
0540                14,3526  42272 0
0541                14,3527  66427 0    2DEC  -.5908647707 B-1  STAR 24   Z
0541                14,3530  64260 1
0542                14,3531  66546 0    2DEC  -.5811943804 B-1  STAR 23   X
0542                14,3532  73302 1
0543                14,3533  73261 0    2DEC  -.2907877154 B-1  STAR 23   Y
0543                14,3534  73575 1
0544                14,3535  14122 0    2DEC  +.7600365758 B-1  STAR 23   Z
0544                14,3536  07016 1
0545                14,3537  61247 1    2DEC  -.9171065276 B-1  STAR 22   X
0545                14,3540  42015 0
0546                14,3541  72314 1    2DEC  -.3500098785 B-1  STAR 22   Y
0546                14,3542  67004 1
```

```
0547                14,3543   74744 0        2DEC   -.1908106439 B-1   STAR 22   Z
0547                14,3544   74104 1
0548                14,3545   70605 0        2DEC   -.4524416631 B-1   STAR 21   X
0548                14,3546   63103 0
0549                14,3547   77154 1        2DEC   -.0492700670 B-1   STAR 21   Y
0549                14,3550   54113 0
0550                14,3551   61601 1        2DEC   -.8904319187 B-1   STAR 21   Z
0550                14,3552   62472 1
0551                14,3553   60604 0        2DEC   -.9525633510 B-1   STAR 20   X
0551                14,3554   63166 0
0552                14,3555   77033 1        2DEC   -.0591313500 B-1   STAR 20   Y
0552                14,3556   63044 1
0553                14,3557   73162 0        2DEC   -.2985406935 B-1   STAR 20   Z
0553                14,3560   53261 1
0554                14,3561   60431 1        2DEC   -.9658240240 B-1   STAR 19   X
0554                14,3562   63350 1
0555                14,3563   00660 1        2DEC   +.0528067543 B-1   STAR 19   Y
0555                14,3564   22763 0
0556                14,3565   04045 1        2DEC   +.2545224762 B-1   STAR 19   Z
0556                14,3566   01424 1
0557                14,3567   62165 1        2DEC   -.8606970465 B-1   STAR 18   X
0557                14,3570   45335 0
0558                14,3571   07327 0        2DEC   +.4638127405 B-1   STAR 18   Y
0558                14,3572   21564 0
0559                14,3573   03267 1        2DEC   +.2099484122 B-1   STAR 18   Z
0559                14,3574   34557 1
0560                14,3575   63472 0        2DEC   -.7741360248 B-1   STAR 17   X
0560                14,3576   50705 0
0561                14,3577   11661 0        2DEC   +.6154234025 B-1   STAR 17   Y
0561                14,3600   21433 0
0562                14,3601   75501 1        2DEC   -.1482142053 B-1   STAR 17   Z
0562                14,3602   72421 0
0563                14,3603   70431 0        2DEC   -.4656165921 B-1   STAR 16   X
0563                14,3604   65316 0
0564                14,3605   07510 1        2DEC   +.4775804724 B-1   STAR 16   Y
0564                14,3606   12666 1
0565                14,3607   13727 1        2DEC   +.7450624681 B-1   STAR 16   Z
0565                14,3610   21520 0
0566                14,3611   72161 1        2DEC   -.3611937602 B-1   STAR 15   X
0566                14,3612   43161 0
0567                14,3613   11144 0        2DEC   +.5748077840 B-1   STAR 15   Y
0567                14,3614   32323 1
0568                14,3615   64200 1        2DEC   -.7342581827 B-1   STAR 15   Z
0568                14,3616   76476 0
0569                14,3617   71323 0        2DEC   -.4116502629 B-1   STAR 14   X
0569                14,3620   70264 0
0570                14,3621   16403 1        2DEC   +.9066387314 B-1   STAR 14   Y
0570                14,3622   05717 0
0571                14,3623   01365 0        2DEC   +.0924676785 B-1   STAR 14   Z
0571                14,3624   17662 0
```

```
0572                14,3625  75055 0
0572                14,3626  75101 0
0573                14,3627  17030 1
0573                14,3630  32613 1
0574                14,3631  73321 0
0574                14,3632  65667 0
0575                14,3633  77010 0
0575                14,3634  66714 0
0576                14,3635  11515 0
0576                14,3636  05314 1
0577                14,3637  63215 1
0577                14,3640  53630 1
0578                14,3641  02145 0
0578                14,3642  21163 0
0579                14,3643  12715 1
0579                14,3644  21123 1
0580                14,3645  13401 0
0580                14,3646  26125 0
0581                14,3647  03161 1
0581                14,3650  14610 0
0582                14,3651  17401 1
0582                14,3652  36465 0
0583                14,3653  75552 1
0583                14,3654  56556 1
0584                14,3655  05473 1
0584                14,3656  01565 0
0585                14,3657  16217 1
0585                14,3660  31643 1
0586                14,3661  04417 1
0586                14,3662  22211 0
0587                14,3663  06444 0
0587                14,3664  33354 0
0588                14,3665  07765 1
0588                14,3666  20153 1
0589                14,3667  14154 1
0589                14,3670  23613 1
0590                14,3671  13202 0
0590                14,3672  05024 1
0591                14,3673  13243 0
0591                14,3674  07665 0
0592                14,3675  01067 1
0592                14,3676  01242 1
0593                14,3677  10561 1
0593                14,3700  05666 1
0594                14,3701  10401 0
0594                14,3702  00357 0
0595                14,3703  65477 0
0595                14,3704  61124 1
0596                14,3705  00154 1
0596                14,3706  03111 0

2DEC  -.1818957154 B-1  STAR 13  X
2DEC  +.9405318128 B-1  STAR 13  Y
2DEC  -.2869039173 B-1  STAR 13  Z
2DEC  -.0614360769 B-1  STAR 12  X
2DEC  +.6031700106 B-1  STAR 12  Y
2DEC  -.7952430739 B-1  STAR 12  Z
2DEC  +.1373948084 B-1  STAR 11  X
2DEC  +.6813398852 B-1  STAR 11  Y
2DEC  +.7189566241 B-1  STAR 11  Z
2DEC  +.2013426456 B-1  STAR 10  X
2DEC  +.9689888101 B-1  STAR 10  Y
2DEC  -.1432544058 B-1  STAR 10  Z
2DEC  +.3509587451 B-1  STAR  9  X
2DEC  +.8925545449 B-1  STAR  9  Y
2DEC  +.2831507435 B-1  STAR  9  Z
2DEC  +.4107492871 B-1  STAR  8  X
2DEC  +.4987190610 B-1  STAR  8  Y
2DEC  +.7632590132 B-1  STAR  8  Z
2DEC  +.7033883645 B-1  STAR  7  X
2DEC  +.7074274193 B-1  STAR  7  Y
2DEC  +.0692188921 B-1  STAR  7  Z
2DEC  +.5450662811 B-1  STAR  6  X
2DEC  +.5313738486 B-1  STAR  6  Y
2DEC  -.6484940879 B-1  STAR  6  Z
2DEC  +.0131955837 B-1  STAR  5  X
```

```
0597                14,3707  00077 1          2DEC  +.0078043793 B-1  STAR 5  Y
0597                14,3710  35676 0
0598                14,3711  17777 0          2DEC  +.9998824772 B-1  STAR 5  Z
0598                14,3712  01142 1
0599                14,3713  07674 0          2DEC  +.4917355818 B-1  STAR 4  X
0599                14,3714  11416 1
0600                14,3715  03415 1          2DEC  +.2203784481 B-1  STAR 4  Y
0600                14,3716  12707 1
0601                14,3717  62413 0          2DEC  -.8423950835 B-1  STAR 4  Z
0601                14,3720  43135 1
0602                14,3721  07511 0          2DEC  +.4776746280 B-1  STAR 3  X
0602                14,3722  03423 1
0603                14,3723  01672 0          2DEC  +.1164935557 B-1  STAR 3  Y
0603                14,3724  12054 0
0604                14,3725  15735 1          2DEC  +.8707790771 B-1  STAR 3  Z
0604                14,3726  15405 1
0605                14,3727  16745 0          2DEC  +.9342726891 B-1  STAR 2  X
0605                14,3730  21763 0
0606                14,3731  02613 1          2DEC  +.1732973829 B-1  STAR 2  Y
0606                14,3732  24675 0
0607                14,3733  73007 1          2DEC  -.3116128956 B-1  STAR 2  Z
0607                14,3734  50430 0
0608                14,3735  15777 1          2DEC  +.8749183324 B-1  STAR 1  X
0608                14,3736  12457 1
0609                14,3737  00324 1          2DEC  +.0258916990 B-1  STAR 1  Y
0609                14,3740  03265 0
0610                14,3741  07571 0          2DEC  +.4835778442 B-1  STAR 1  Z
0610                14,3742  17020 0
0611                14,3743  15325 1  CATLOG  DEC   6869
```

L AGC BLOCK TWO SELF-CHECK

USER=S PAGE NO. 1 E0 S3

DATE 20 DECEMBER 1967
LOG SECTION AGC BLOCK TWO SELF-CHECK
ASSEMBLY SUBROUTINE UTILITYM REV 25

R0001 PROGRAM DESCRIPTION
R0003 PROGRAM NAME - SELF-CHECK
R0005 MOD NO - 1
R0007 MOD BY - GAUNTT
R0008 FUNCTIONAL DESCRIPTION

R0009 PROGRAM HAS TWO MAIN PARTS. THE FIRST IS SELF-CHECK WHICH RUNS AS A ZERO PRIORITY JOB WITH NO CORE SET, AS
R0011 PART OF THE BACK-UP IDLE LOOP. THE SECOND IS SHOW-BANKSUM WHICH RUNS AS A REGULAR EXECUTIVE JOB WITH ITS OWN
R0013 STARTING VERB.
R0014 THE PURPOSE OF SELF-CHECK IS TO CHECK OUT VARIOUS PARTS OF THE COMPUTER AS OUTLINED BELOW IN THE OPTIONS.
R0016 THE PURPOSE OF SHOW-BANKSUM IS TO DISPLAY THE SUM OF EACH BANK , ONE AT A TIME.
R0020 IN ALL THERE ARE 7 POSSIBLE OPTIONS IN THIS BLOCK II VERSION OF SELF-CHECK. MORE DETAIL DESCRIPTION MAY BE
R0022 FOUND IN E-2065 BLOCK II AGC SELF-CHECK AND SHOW BANKSUM BY EDWIN D. SMALLY DECEMBER 1966, AND ADDENDA 2 AND 3.
R0024 THE DIFFERENT OPTIONS ARE CONTROLLED BY PUTTING DIFFERENT NUMBERS IN THE SMODE REGISTER (NOUN 27). BELOW IS
R0026 A DESCRIPTION OF WHAT PARTS OF THE COMPUTER THAT ARE CHECKED BY THE OPTIONS, AND THE CORRESPONDING NUMBER, IN
R0028 OCTAL, TO LOAD INTO SMODE.
R0032 +-4 ERASABLE MEMORY
R0033 +-5 FIXED MEMORY
R0034 +-1,2,3,6,7,10 EVERYTHING IN OPTIONS 4 AND 5.
R0036 -0 SAME AS +-10 UNTIL AN ERROR IS DETECTED.
R0037 +0 NO CHECK, PUTS COMPUTER INTO THE BACKUP IDLE LOOP.
R0038 WARNINGS

R0039 USE OF E MEMORY RESERVED FOR SELF-CHECK (EVEN IN IDLE LOOP) AS TEMP STORAGE BY OTHER PROGRAMS IS DANGEROUS.
R0041 SMODE SET GREATER THAN OCT 10 PUTS COMPUTER INTO BACKUP IDLE LOOP.
R0042 CALLING SEQUENCE

R0043 TO CALL SELF-CHECK KEY IN
R0044 V 21 N 27 E OPTION NUMBER E
R0047 TO CALL SHOW-BANKSUM KEY IN
R0048 V 91 E DISPLAYS FIRST BANK
R0049 V 33 E PROCEED, DISPLAYS NEXT BANK
R0050 EXIT MODES, NORMAL AND ALARM

R0051 SELF-CHECK NORMALLY CONTINUES INDEFINITELY UNLESS THERE IS AN ERROR DETECTED. IF SO + OPTION NUMBERS PUT
R0053 COMPUTER INTO BACKUP IDLE LOOP, - OPTION NUMBERS RESTART THE OPTION.
R0054 THE -0 OPTION PROCEEDS FROM THE LINE FOLLOWING THE LINE WHERE THE ERROR WAS DETECTED.
R0057 SHOW-BANKSUM PROCEEDS UNTIL A TERMINATE IS KEYED IN (V 34 E). THE COMPUTER IS PUT INTO THE BACKUP IDLE LOOP
R0059
R0060 OUTPUT

```
R0061       SELF-CHECK UPON DETECTING AN ERROR LOADS THE SELF-CHECK ALARM CONSTANT (01102) INTO THE FAILREG SET AND
R0063   TURNS ON THE ALARM LIGHT. THE OPERATOR MAY THEN DISPLAY THE THREE FAILREGS BY KEYING IN V 05 N 09 E. FOR FURTHER
R0065   INFORMATION HE MAY KEY IN V 05 N 08 E, THE DSKY DISPLAY IN R1 WILL BE ADDRESS+1 OF WHERE THE ERROR WAS DETECTED,
R0067   IN R2 THE BBCON OF SELF-CHECK, AND IN R3 THE TOTAL NUMBER OF ERRORS DETECTED BY SELF-CHECK SINCE THE LAST MAN
R0069   INITIATED FRESH START (SLAP1).
R0073       SHOW-BANKSUM STARTING WITH BANK 0 DISPLAYS IN R1 THE BANK SUM (A +-NUMBER EQUAL TO THE BANK NUMBER), IN R2
R0075   THE BANK NUMBER, AND IN R3 THE BUGGER WORD.
R0076   ERASABLE INITIALIZATION REQUIRED

R0077       ACCOMPLISHED BY FRESH START
R0078           SMODE SET TO +0
R0079   DEBRIS

R0080       ALL EXITS FROM THE CHECK OF ERASABLE (ERASCHK) RESTORE ORIGINAL CONTENTS TO REGISTERS UNDER CHECK.
R0082   EXCEPTION IS A RESTART. RESTART THAT OCCURS DURING ERASCHK RESTORES ERASABLE, UNLESS THERE IS EVIDENCE TO DOUBT
R0084   E MEMORY, IN WHICH CASE PROGRAM THEN DOES A FRESH START (DOFSTART).
 0085                       25,3766                          BANK    25
 0086   REF   1             43,2000                          SETLOC  SELFCHEC
 0087                       43,3230                          BANK

 0088   REF   1                                              COUNT   43/SELF

 0089   REF  76  LAST 1174      4712          SBIT1   EQUALS BIT1
 0090   REF  44  LAST 1174      4711          SBIT2   EQUALS BIT2
 0091   REF  33  LAST 1174      4710          SBIT3   EQUALS BIT3
 0092   REF  40  LAST 1174      4707          SBIT4   EQUALS BIT4
 0093   REF  39  LAST 1089      4706          SBIT5   EQUALS BIT5
 0094   REF  44  LAST 1131      4705          SBIT6   EQUALS BIT6
 0095   REF  53  LAST 1171      4704          SBIT7   EQUALS BIT7
 0096   REF  28  LAST 1196      4703          SBIT8   EQUALS BIT8
 0097   REF  32  LAST 1010      4702          SBIT9   EQUALS BIT9
 0098   REF  37  LAST 1174      4701          SBIT10  EQUALS BIT10
 0099   REF  35  LAST 1174      4700          SBIT11  EQUALS BIT11
 0100   REF  31  LAST 1174      4677          SBIT12  EQUALS BIT12
 0101   REF  44  LAST 1174      4676          SBIT13  EQUALS BIT13
 0102   REF  75  LAST 1335      4675          SBIT14  EQUALS BIT14
 0103   REF  49  LAST 1174      4674          SBIT15  EQUALS BIT15

 0104   REF 252  LAST 1294      4714          S+ZERO  EQUALS ZERO
 0105   REF  77  LAST 1363      4712          S+1     EQUALS BIT1
 0106   REF  45  LAST 1363      4711          S+2     EQUALS BIT2
 0107   REF  45  LAST 1337      6214          S+3     EQUALS THREE
 0108   REF  19  LAST 1335      4710          S+4     EQUALS FOUR
 0109   REF  28  LAST 1109      4715          S+5     EQUALS FIVE
```

L AGC BLOCK TWO SELF-CHECK USER'S PAGE NO. 3 E0 S3

```
0110  REP  40  LAST 1338     6211              S+6       EQUALS SIX
0111  REP  18  LAST 1174     4716              S+7       EQUALS SEVEN
0112  REP  13  LAST 1164     4373              S8BITS    EQUALS LO7B
0113  REP   4  LAST 1062     4726              CNTRCON   =      OCT50
0114                      43,3230  00061 0     ERASCON1  OCTAL  00061
0115                      43,3231  01373 1     ERASCON2  OCTAL  01373
0116  REP   8  LAST 1174     4744              ERASCON8  =      OCT1400
0117                      43,3232  01461 0     ERASCON3  OCTAL  01461
0118                      43,3233  01773 0     ERASCON4  OCTAL  01773
0119  REP  19  LAST 1099     4747              S10BITS   EQUALS LO3I0
0120  REP   4  LAST  919     4755              SRNK03    EQUALS PRIO8
0121  REP   6  LAST 1174     4364              -MAXADRS  =      HI5
0122                      43,3234  00060 1     SIXTY     OCTAL  00060
0123                      43,3235  60017 1     SUPRCON   OCTAL  60017
0124                      43,3236  17777 0     S13BITS   OCTAL  17777
0125                      43,3237  25252 0     CONC+S1   OCTAL  25252
0126                      43,3240  52400 1     CONC+S2   OCTAL  52400
0127                      43,3241  76777 1     ERASCON5  OCTAL  76777
0128  REP   2  LAST  199     5630              S-7       =      OCT77770
0129  REP   3  LAST 1083     6061              S-4       EQUALS NEG4
0130  REP   3  LAST  569     7714              S-3       EQUALS NEG3
0131  REP   6  LAST 1178     7715              S-2       EQUALS NEG2
0132  REP  29  LAST 1174     7716              S-1       EQUALS NEGONE
0133  REP  15  LAST 1071     4713              S-ZERO    EQUALS NEG0

0134  REP  46  LAST 1205  E3,1400                        EBANK=  LST1
0135  REP   3  LAST  257  43,3242  01371 0     ADRS1     ADRES   SKEEP1
0136  REP   4  LAST 1190  43,3243  03334 0     SELFADRS  ADRES   SELFCHK
A0137
A0138
A0139

0140  REP   6  LAST  182  43,3244  3 1360 0    PRERRORS  CA      ERESTORE
0141                      43,3245  0 0006 1              EXTEND
0142  REP   1              43,3246  1 3255 1              BZF     ERRORS
0143                      43,3247  0 0006 1              EXTEND
0144  REP   3  LAST  182  43,3250  3 1376 1              DCA     SKEEP5
0145  REP   3  LAST  182  43,3251  51*377 0              INDEX   SKEEP7
0146                      43,3252  52 001 1              DXCH    0000
0147  REP   2  LAST  257  43,3253  3 4714 1              CA      S+ZERO
0148  REP   7  LAST 1364  43,3254  55*360 1             TS      ERESTORE
0149                      43,3255  0 0004 0    ERRORS    INHINT
0150  REP 303  LAST 1287  43,3256  3 0002 0              CA      Q
0151  REP   3  LAST  382  43,3257  55*357 0             TS      SFAIL
0152  REP   3  LAST  266  43,3260  55*363 1             TS      ALMCADR
0153  REP   3  LAST  179  43,3261  25*365 0             INCR    ERCOUNT
0154  REP   1              43,3262  0 5541 1    TCALARM2  TC      ALARM2
0155                      43,3263   01102 0             CCT     01102
0156  REP   5  LAST  266  43,3264  11*362 0             CCS     SMODE
0157  REP   3  LAST 1364  43,3265  3 4714 1    SIDLOOP   CA      S+ZERO
```

00377
USED IN CNTRCHK
USED IN ERASCHK
USED IN ERASCHK
USED IN ERASCHK
USED IN ERASCHK
USED IN ERASCHK
01777, USED IN ERASCHK
06000, USED IN ROPECHK
FOR ROPECHK

USED IN ROPECHK

USED IN CYCLSHFT
USED IN CYCLSHFT

SELFCHK RETURN ADDRESS. SHOULD BE PUT IN SELFRET WHEN GOING FROM SELFCHK TO SHOWSUM AND PUT IN SKEEP1 WHEN GOING FROM SHOWSUM TO SELF-CHECK.

IS IT NECESSARY TO RESTORE ERASABLE

NO

RESTORE THE TWO ERASABLE REGISTERS

SAVE Q FOR FAILURE LOCATION
FOR DISPLAY WITH BRANK AND ERCOUNT
KEEP TRACK OF NUMBER OF MALFUNCTIONS.

SELF-CHECK MALFUNCTION INDICATOR

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0158  REF   6  LAST 1364   43,3266  55=362 0            TS      SMODE
0159  REF   5  LAST 1364   43,3267  0 3334 0            TC      SELFCHK      GO TO IDLE LOOP
0160  REF   4  LAST 1364   43,3270  0 1357 1            TC      SFAIL        CONTINUE WITH SELF-CHECK

0161  REF 344  LAST 1338   43,3271  10 000 0  -1CHK     CCS     A
0162  REF   1              43,3272  1 3244 1            TCF     PRERRORS
0163  REF   2  LAST 1365   43,3273  1 3244 1            TCF     PRERRORS
0164  REF 345  LAST 1365   43,3274  10 000 0            CCS     A
0165  REF   3  LAST 1365   43,3275  1 3244 1            TCF     PRERRORS
0166  REF 304  LAST 1364   43,3276  0 0002 0            TC      Q

0167                       43,3277  0 0006 1  SMODECHK  EXTEND
0168  REF   4  LAST 1364   43,3300  23=371 0            QXCH    SKEEP1
0169  REF   1              43,3301  0 3330 1            TC      CHECKNJ      CHECK FOR NEW JOB
0170  REF   7  LAST 1365   43,3302  11=362 0            CCS     SMODE
0171  REF   1              43,3303  0 3310 0            TC      SOPTIONS
0172  REF   1              43,3304  0 3301 0            TC      SMODECHK +2  TO BACKUP IDLE LOOP
0173  REF   2  LAST 1365   43,3305  0 3310 0            TC      SOPTIONS
0174  REF   2  LAST   80   43,3306  25=366 0            INCR    SCOUNT
0175  REF   5  LAST 1365   43,3307  0 1371 0            TC      SKEEP1       CONTINUE WITH SELF-CHECK

0176  REF   1              43,3310  6 5630 1  SOPTIONS  AD      S-7
0177                       43,3311  0 0006 1            EXTEND
0178                       43,3312  6 3314 1            BZMF    +2           FOR OPTIONS BELOW NINE.
0179  REF   1              43,3313  0 3265 0  BNKOPTN   TC      SIDLOOP      ILLEGAL OPTION.  GO TO IDLE LOOP.
0180  REF   3  LAST 1365   43,3314  25=366 0            INCR    SCOUNT       FOR OPTIONS BELOW NINE.
0181  REF   1              43,3315  6 4716 0            AD      S+7

0182  REF 346  LAST 1365   43,3316  50 000 1            INDEX   A
0183  REF   1              43,3317  0 3320 0            TC      SOPTION1
0184  REF   6  LAST 1365   43,3320  0 1371 0  SOPTION1  TC      SKEEP1       WAS TC+TCF
0185  REF   7  LAST 1365   43,3321  0 1371 0  SOPTION2  TC      SKEEP1       WAS IN'OUT1
0186  REF   8  LAST 1365   43,3322  0 1371 0  SOPTION3  TC      SKEEP1       WAS COUNTCHK
0187  REF   1              43,3323  0 3335 1  SOPTION4  TC      ERASCHK
0188  REF   1              43,3324  0 3516 0  SOPTION5  TC      ROPECHK
0189  REF   9  LAST 1365   43,3325  0 1371 0  SOPTION6  TC      SKEEP1
0190  REF  10  LAST 1365   43,3326  0 1371 0  SOPTION7  TC      SKEEP1
0191  REF  11  LAST 1365   43,3327  0 1371 0  SOPTON10  TC      SKEEP1       CONTINUE WITH SELF-CHECK

0192                       43,3330  0 0006 1  CHECKNJ   EXTEND
0193  REF   7  LAST 1190   43,3331  23=361 1            QXCH    SELFRET      SAVE RETURN ADDRESS WHILE TESTING NEWJOB
0194  REF  61  LAST 1230   43,3332  0 4574 0            TC      POSTJUMP     TO SEE IF ANY JOBS HAVE BECOME ACTIVE.
0195  REF   2  LAST 1185   43,3333   03231 1            CADR    ADVAN

0196  REF   2  LAST 1365   43,3334  0 3277 0  SELFCHK   TC      SMODECHK     ** CHARLEY, COME IN HERE

R0197  SKEEP7 HOLDS LOWEST OF TWO ADDRESSES BEING CHECKED.
R0198  SKEEP6 HOLDS B(X+1).
R0199  SKEEP5 HOLDS B(X).
R0200  SKEEP4 HOLDS C(EBANK) DURING ERASLOOP AND CHECKNJ.
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R0201  SKEEP3 HOLDS LAST ADDRESS BEING CHECKED (HIGHEST ADDRESS).
R0202  SKEEP2 CONTROLS CHECKING OF NON-SWITCHABLE ERASABLE MEMORY WITH BANK NUMBERS IN EB.
R0204  ERASCHK TAKES APPROXIMATELY 7 SECONDS
 0205  REP   2 LAST  257   43,3335  3 4712 1  ERASCHK  CA     S+1
 0206  REP   3 LAST  257   43,3336  55=372 1           TS     SKEEP2
 0207  REP   4 LAST 1364   43,3337  3 4714 1  0EBANK   CA     S+ZERO
 0208  REP  51 LAST 1164   43,3340  54 003 0           TS     EBANK
 0209  REP   1            43,3341  3 3232 1           CA     ERASCON3      01461
 0210  REP   4 LAST 1364   43,3342  55=377 1           TS     SKEEP7        STARTING ADDRESS
 0211  REP   1            43,3343  3 4747 1           CA     S10BITS       01777
 0212  REP   3 LAST  257   43,3344  55=373 0           TS     SKEEP3        LAST ADDRESS CHECKED
 0213  REP   1            43,3345  0 3365 1           TC     ERASLOOP

 0214  REP   1            43,3346  3 4744 1  E134567B CA     ERASCON6      01400
 0215  REP   5 LAST 1366   43,3347  55=377 1           TS     SKEEP7        STARTING ADDRESS
 0216  REP   2 LAST 1366   43,3350  3 4747 1           CA     S10BITS       01777
 0217  REP   4 LAST 1366   43,3351  55=373 0           TS     SKEEP3        LAST ADDRESS CHECKED
 0218  REP   2 LAST 1366   43,3352  0 3365 1           TC     ERASLOOP

 0219  REP   2 LAST 1366   43,3353  3 4744 1  2EBANK   CA     ERASCON6      01400
 0220  REP   6 LAST 1366   43,3354  55=377 1           TS     SKEEP7        STARTING ADDRESS
 0221  REP   1            43,3355  3 3233 0           CA     ERASCON4      01773
 0222  REP   5 LAST 1366   43,3356  55=373 0           TS     SKEEP3        LAST ADDRESS CHECKED
 0223  REP   3 LAST 1366   43,3357  0 3365 1           TC     ERASLOOP

 0224  REP   4 LAST 1366   43,3360  55=372 1  NOEBANK  TS     SKEEP2        +0
 0225  REP   1            43,3361  3 3230 0           CA     ERASCON1      00061
 0226  REP   7 LAST 1366   43,3362  55=377 1           TS     SKEEP7        STARTING ADDRESS
 0227  REP   1            43,3363  3 3231 1           CA     ERASCON2      01373
 0228  REP   6 LAST 1366   43,3364  55=373 0           TS     SKEEP3        LAST ADDRESS CHECKED

 0229                      43,3365  -0 0004 0 ERASLOOP INHINT
 0230  REP  52 LAST 1366   43,3366  3 0003 1           CA     EBANK         STORES C(EBANK)
 0231  REP   3 LAST  182   43,3367  55=374 1           TS     SKEEP4
 0232                      43,3370  0 0006 1           EXTEND
 0233  REP   8 LAST 1366   43,3371  5 1377 0           NDX    SKEEP7
 0234                      43,3372  3 0001 0           DCA    0000
 0235  REP   4 LAST 1364   43,3373  53=376 0           DXCH   SKEEP5        STORES C(X) AND C(X+1) IN SKEEP6 AND 5.
 0236  REP   9 LAST 1366   43,3374  3 1377 0           CA     SKEEP7
 0237  REP   8 LAST 1364   43,3375  55=360 1           TS     ERESTORE      IF RESTART, RESTORE C(X) AND C(X+1)
 0238  REP 213 LAST 1294   43,3376  54 001 1           TS     L
 0239  REP 214 LAST 1366   43,3377  24 001 0           INCR   L
 0240  REP 347 LAST 1365   43,3400  50 000 1           NDX    A
 0241                      43,3401  52 001 1           DXCH   0000          PUTS OWN ADDRESS IN X AND X +1
 0242  REP  10 LAST 1366   43,3402  51=377 0           NDX    SKEEP7
 0243                      43,3403  4 0001 1           CS     0001          CS  X+1
 0244  REP  11 LAST 1366   43,3404  51=377 0           NDX    SKEEP7
 0245                      43,3405  6 0000 1           AD     0000          AD X
 0246  REP   1            43,3406  0 3271 0           TC     -1CHK
 0247  REP   9 LAST 1366   43,3407  3 1360 0           CA     ERESTORE      HAS ERASABLE BEEN RESTORED
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0248                          43,3410  0 0006 1          EXTEND
0249  REP   1                 43,3411  1 3435 1          BZF   ELOOPFIN       YES, EXIT ERASLOOP.
0250                          43,3412  0 0006 1          EXTEND
0251  REP  12  LAST 1366     43,3413  5 1377 0          NDX   SKEEP7
0252                          43,3414  4 0001 1          DCS   0000            COMPLEMENT OF ADDRESS OF X AND X+1
0253  REP  13  LAST 1367     43,3415  51=377 0          NDX   SKEEP7
0254                          43,3416  52 001 1          DXCH  0000            PUT COMPLEMENT OF ADDRESS OF X AND X+1
0255  REP  14  LAST 1367     43,3417  51=377 0          NDX   SKEEP7
0256                          43,3420  4 0000 0          CS    0000            CS  X
0257  REP  15  LAST 1367     43,3421  51=377 0          NDX   SKEEP7
0258                          43,3422  6 0001 0          AD    0001            AD X+1
0259  REP   2  LAST 1366     43,3423  0 3271 0          TC    -1CHK
0260  REP  10  LAST 1366     43,3424  3 1360 0          CA    ERESTORE        HAS ERASABLE BEEN RESTORED
0261                          43,3425  0 0006 1          EXTEND
0262  REP   2  LAST 1367     43,3426  1 3435 1          BZF   ELOOPFIN       YES, EXIT ERASLOOP.
0263                          43,3427  0 0006 1          EXTEND
0264  REP   5  LAST 1366     43,3430  3 1376 1          DCA   SKEEP5
0265  REP  16  LAST 1367     43,3431  51=377 0          NDX   SKEEP7
0266                          43,3432  52 001 1          DXCH  0000            PUT B(X) AND B(X+1) BACK INTO X AND X+1
0267  REP   5  LAST 1366     43,3433  3 4714 1          CA    S+ZERO
0268  REP  11  LAST 1367     43,3434  55=360 1          TS    ERESTORE        IF RESTART, DO NOT RESTORE C(X), C(X+1)
0269                          43,3435  0 0003 1  ELOOPFIN RELINT
0270  REP   2  LAST 1365     43,3436  0 3330 1          TC    CHECKNJ         CHECK FOR NEW JOB
0271  REP   4  LAST 1366     43,3437  3 1374 0          CA    SKEEP4          REPLACES B(EBANK)
0272  REP  53  LAST 1366     43,3440  54 003 0          TS    EBANK
0273  REP  17  LAST 1367     43,3441  25=377 0          INCR  SKEEP7
0274  REP  18  LAST 1367     43,3442  4 1377 1          CS    SKEEP7
0275  REP   7  LAST 1366     43,3443  6 1373 1          AD    SKEEP3
0276                          43,3444  0 0006 1          EXTEND
0277                          43,3445  1 3447 1          BZF   +2
0278  REP   4  LAST 1366     43,3446  0 3365 1          TC    ERASLOOP        GO TO NEXT ADDRESS IN SAME BANK
0279  REP   5  LAST 1366     43,3447  11=372 1          CCS   SKEEP2
0280  REP   1                 43,3450  0 3360 1          TC    NOEBANK
0281  REP   6  LAST 1367     43,3451  25=372 0          INCR  SKEEP2          PUT +1 IN SKEEP2.
0282  REP  54  LAST 1367     43,3452  3 0003 1          CA    EBANK
0283  REP   1                 43,3453  6 4702 0          AD    SBIT9
0284  REP  55  LAST 1367     43,3454  54 003 0          TS    EBANK
0285  REP   1                 43,3455  6 3241 0          AD    ERASCON5        76777, CHECK FOR BANK E2
0286                          43,3456  0 0006 1          EXTEND
0287  REP   1                 43,3457  1 3353 0          BZF   2EBANK
0288  REP  56  LAST 1367     43,3460  10 003 0          CCS   EBANK
0289  REP   1                 43,3461  0 3346 0          TC    E134567B        GO TO EBANKS 1,3,4,5,6, AND 7
0290  REP   3  LAST 1366     43,3462  3 4744 1          CA    ERASCON6        END OF ERASCHK
0291  REP  57  LAST 1367     43,3463  54 003 0          TS    EBANK
R0292 CNTRCHK PERFORMS A CS OF ALL REGISTERS FROM OCT. 60 THROUGH OCT. 10.
R0293  INCLUDED ARE ALL COUNTERS, T6-1, CYCLE AND SHIFT, AND ALL RUPT REGISTERS
0294  REP   1                 43,3464  3 4726 0  CNTRCHK  CA    CNTRCON         00050
0295  REP   7  LAST 1367     43,3465  55=372 1  CNTRLOOP TS    SKEEP2
0296  REP   1                 43,3466  6 4707 0          AD    SBIT4           +10 OCTAL
0297  REP 348  LAST 1366      43,3467  50 000 1          INDEX A
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 0298                          43,3470  4 0000 0          CS    0000
 0299  REF   6  LAST 1367     43,3471  11=372 1          CCS   SKEEP2
 0300  REF   1                43,3472  0 3465 0          TC    CNTRLOOP

R0301  CYCLSHFT CHECKS THE CYCLE AND SHIFT REGISTERS
 0302  REF   1                43,3473  3 3237 1  CYCLSHFT CA    CONC+S1      25252
 0303  REF  42  LAST 1166     43,3474  54 020 1          TS    CYR          C(CYR) = 12525
 0304  REF  22  LAST 1156     43,3475  54 022 0          TS    CYL          C(CYL) = 52524
 0305  REF  29  LAST 1156     43,3476  54 021 0          TS    SR           C(SR) = 12525
 0306  REF  11  LAST 1078     43,3477  54 023 1          TS    EDOP         C(EDOP) = 00125
 0307  REF  43  LAST 1368     43,3500  6 0020 0          AD    CYR          37777        C(CYR) = 45252
 0308  REF  23  LAST 1368     43,3501  6 0022 1          AD    CYL          00-12524     C(CYL) = 25251
 0309  REF  30  LAST 1368     43,3502  6 0021 1          AD    SR           00-25251     C(SR) = 05252
 0310  REF  12  LAST 1368     43,3503  6 0023 0          AD    EDOP         00-25376     C(EDOP) = +0
 0311  REF   1                43,3504  6 3240 1          AD    CONC+S2      C(CONC+S2) = 52400
 0312  REF   3  LAST 1367     43,3505  0 3271 0          TC    -1CHK
 0313  REF  44  LAST 1368     43,3506  6 0020 0          AD    CYR          45252
 0314  REF  24  LAST 1368     43,3507  6 0022 1          AD    CYL          72523
 0315  REF  31  LAST 1368     43,3510  6 0021 1          AD    SR           77775
 0316  REF  13  LAST 1368     43,3511  6 0023 0          AD    EDOP         77775
 0317  REF   3  LAST 1366     43,3512  6 4712 1          AD    S+1          77776
 0318  REF   4  LAST 1368     43,3513  0 3271 0          TC    -1CHK

 0319  REF   4  LAST 1365     43,3514  25=367 1          INCR  SCOUNT +1
 0320  REF   3  LAST 1365     43,3515  0 3277 0          TC    SMODECHK
R0321  SKEEP1 HOLDS SUM
R0322  SKEEP2 HOLDS PRESENT CONTENTS OF ADDRESS IN ROPECHK AND SHOWSUM ROUTINES
R0323  SKEEP2 HOLDS BANK NUMBER IN LOW ORDER BITS DURING SHOWSUM DISPLAY
R0324  SKEEP3 HOLDS PRESENT ADDRESS (00000 TO 01777 IN COMMON FIXED BANKS).
R0325                             (04000 TO 07777 IN FXFX BANKS)
R0326  SKEEP3 HOLDS BUGGER WORD DURING SHOWSUM DISPLAY
R0327  SKEEP4 HOLDS BANK NUMBER AND SUPER BANK NUMBER
R0328  SKEEP5 COUNTS 2 SUCCESSIVE TC SELF WORDS
R0329  SKEEP6 CONTROLS ROPECHK OR SHOWSUM OPTION
R0330  SKEEP7 CONTROLS WHEN ROUTINE IS IN COMMON FIXED OR FIXED FIXED BANKS

 0331  REF   1                43,3516  3 4713 0  ROPECHK  CA    S-ZERO       *
03311  REF   4  LAST  257     43,3517  55=376 0          TS    SKEEP6       * -0 FOR ROPECHK.
03312  REF   6  LAST 1367     43,3520  3 4714 1  STSHOSUM CA    S+ZERO       * SHOULD BE ROPECHK

 0332  REF   5  LAST 1367     43,3521  55=374 1          TS    SKEEP4       BANK NUMBER
 0333  REF   4  LAST 1368     43,3522  3 4712 1          CA    S+1
 0334  REF  19  LAST 1367     43,3523  55=377 1  COMMFX   TS    SKEEP7
 0335  REF   7  LAST 1368     43,3524  3 4714 1          CA    S+ZERO
 0336  REF  12  LAST 1365     43,3525  55=371 1          TS    SKEEP1
 0337  REF   8  LAST 1367     43,3526  55=373 0          TS    SKEEP3
 0338  REF   5  LAST 1368     43,3527  3 4712 1          CA    S+1
 0339  REF   6  LAST 1367     43,3530  55=375 0          TS    SKEEP5       COUNTS DOWN 2 TC SELF WORDS
 0340  REF   6  LAST 1368     43,3531  3 1374 0  COMADRS  CA    SKEEP4
 0341  REF 215  LAST 1366     43,3532  54 001 1          TS    L            TO SET SUPER BANK
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0342  REP   7  LAST 1364   43,3533  7 4364 0          MASK   HI5
0343  REP   9  LAST 1368   43,3534  6 1373 1          AD     SKEEP3
0344  REP   2  LAST  352   43,3535  0 4610 1          TC     SUPDACAL      SUPER DATA CALL
0345  REP   1              43,3536  0 3561 0          TC     ADSUM
0346  REP   1              43,3537  6 4700 1          AD     SBIT11        02000
0347  REP   1              43,3540  0 3572 1          TC     ADRSCHK

0348  REP 349  LAST 1367   43,3541  4 0000 0 PXPX     CS     A
0349  REP  20  LAST 1368   43,3542  55=377 1          TS     SKEEP7
0350                       43,3543  0 0006 1          EXTEND
0351                       43,3544  1 3547 0          BZF    +3
0352  REP   1              43,3545  3 4677 0          CA     SBIT12        04000, STARTING ADDRESS OF BANK 02
0353                       43,3546  0 3550 1          TC     +2
0354  REP   1              43,3547  3 4755 1          CA     SBNK03        06000, STARTING ADDRESS OF BANK 03
0355  REP  10  LAST 1369   43,3550  55=373 0          TS     SKEEP3
0356  REP   8  LAST 1368   43,3551  3 4714 1          CA     S+ZERO
0357  REP  13  LAST 1368   43,3552  55=371 1          TS     SKEEP1
0358  REP   6  LAST 1368   43,3553  3 4712 1          CA     S+1
0359  REP   7  LAST 1368   43,3554  55=375 0          TS     SKEEP5        COUNTS DOWN 2 TC SELF WORDS
0360  REP  11  LAST 1369   43,3555  51=373 1 PXADRS   INDEX  SKEEP3
0361                       43,3556  3 0000 1          CA     0000
0362  REP   2  LAST 1369   43,3557  0 3561 0          TC     ADSUM
0363  REP   2  LAST 1369   43,3560  0 3572 1          TC     ADRSCHK

0364  REP   9  LAST 1368   43,3561  55=372 1 ADSUM    TS     SKEEP2
0365  REP  14  LAST 1369   43,3562  6 1371 0          AD     SKEEP1
0366  REP  15  LAST 1369   43,3563  55=371 1          TS     SKEEP1
0367  REP   9  LAST 1369   43,3564  3 4714 1          CAF    S+ZERO
0368  REP  16  LAST 1369   43,3565  6 1371 0          AD     SKEEP1
0369  REP  17  LAST 1369   43,3566  55=371 1          TS     SKEEP1
0370  REP  10  LAST 1369   43,3567  4 1372 1          CS     SKEEP2
0371  REP  12  LAST 1369   43,3570  6 1373 1          AD     SKEEP3
0372  REP 305  LAST 1365   43,3571  0 0002 0          TC     Q

0373  REP 350  LAST 1369   43,3572  22 000 1 ADRSCHK  LXCH   A
0374  REP  13  LAST 1369   43,3573  3 1373 1          CA     SKEEP3
0375  REP  20  LAST 1364   43,3574  7 4747 0          MASK   LOW10         RELATIVE ADDRESS
0376  REP   1              43,3575  6 4364 1          AD     -MAXADRS      SUBTRACT MAX RELATIVE ADDRESS = 1777.
0377                       43,3576  0 0006 1          EXTEND
0378  REP   1              43,3577  1 3666 0          BZF    SOPTION       CHECKSUM FINISHED IF LAST ADDRESS.
0379  REP   8  LAST 1369   43,3600  11=375 0          CCS    SKEEP5        IS CHECKSUM FINISHED
0380                       43,3601  0 3604 0          TC     +3            NO
0381                       43,3602  0 3604 0          TC     +2            NO
0382  REP   2  LAST 1369   43,3603  0 3666 1          TC     SOPTION       GO TO ROPECHK SHOWSUM OPTION.
0383  REP 216  LAST 1368   43,3604  10 001 1          CCS    L             -0 MEANS A TC SELF WORD.
0384  REP   1              43,3605  0 3614 1          TC     CONTINU
0385  REP   2  LAST 1369   43,3606  0 3614 1          TC     CONTINU
0386  REP   3  LAST 1369   43,3607  0 3614 1          TC     CONTINU
0387  REP   9  LAST 1369   43,3610  11=375 0          CCS    SKEEP5
0388  REP   4  LAST 1369   43,3611  0 3615 0          TC     CONTINU +1
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L AGC BLOCK TWO SELF-CHECK


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0389  REP  1                 43,3612  3 7716 0                CA    S-1
0390  REP  5  LAST 1369      43,3613  0 3615 0                TC    CONTINU +1     AD IN THE BUGGER WORD
0391  REP  7  LAST 1369      43,3614  3 4712 1  CONTINU       CA    S+1            MAKE SURE TWO CONSECUTIVE TC SELF WORDS
0392  REP  10 LAST 1369      43,3615  55#375 0                TS    SKEEP5
03921 REP  5  LAST 1368      43,3616  11#376 0                CCS   SKEEP6         *
03922 REP  21 LAST 1190      43,3617  10 067 1                CCS   NEWJOB         * +1, SHOWSUM
03923 REP  4  LAST  828      43,3620  0 5057 0                TC    CHANG1         *
03924                        43,3621  0 3623 0                TC    +2             *
0393  REP  3  LAST 1367      43,3622  0 3330 1                TC    CHECKNJ        -0 IN SKEEP8 FOR ROPECHK

0394  REP  14 LAST 1369      43,3623  25#373 1  ADRS+1        INCR  SKEEP3
0395  REP  21 LAST 1369      43,3624  11#377 1                CCS   SKEEP7
0396  REP  1                 43,3625  0 3531 0                TC    COMADRS
0397  REP  2  LAST 1370      43,3626  0 3531 0                TC    COMADRS
0398  REP  1                 43,3627  0 3555 1                TC    FXADRS
0399  REP  2  LAST 1370      43,3630  0 3555 1                TC    FXADRS

0400  REP  7  LAST 1368      43,3631  4 1374 1  NXTBNK        CS    SKEEP4
0401  REP  1                 43,3632  6 3721 0                AD    LSTBNKCH       LAST BANK TO BE CHECKED
0402                         43,3633  0 0006 1                EXTEND
0403  REP  1                 43,3634  1 3000 0                BZF   ENDSUMS        END OF SUMMING OF BANKS.
0404  REP  8  LAST 1370      43,3635  3 1374 0                CA    SKEEP4
0405  REP  2  LAST 1369      43,3636  6 4700 1                AD    SBIT11
0406  REP  9  LAST 1370      43,3637  55#374 1                TS    SKEEP4         37 TO 40 INCRMTS SKEEP4 BY END RND CARRY
0407  REP  1                 43,3640  0 3644 1                TC    CHKSUPR
0408  REP  1                 43,3641  3 4674 0  17TO20        CA    SBIT15
0409  REP  10 LAST 1370      43,3642  27#374 1                ADS   SKEEP4         SET FOR BANK 20
0410  REP  1                 43,3643  0 3660 1                TC    GONXTBNK
0411  REP  8  LAST 1369      43,3644  7 4364 0  CHKSUPR       MASK  HI5
0412                         43,3645  0 0006 1                EXTEND
0413  REP  1                 43,3646  1 3656 0                BZF   NXTSUPR        INCREMENT SUPER BANK
0414  REP  1                 43,3647  6 3236 0  27TO30        AD    S13BITS
0415                         43,3650  0 0006 1                EXTEND
0416                         43,3651  1 3653 0                BZF   +2             BANK SET FOR 30
0417  REP  2  LAST 1370      43,3652  0 3660 1                TC    GONXTBNK
0418  REP  1                 43,3653  3 3234 1                CA    SIXTY          FIRST SUPER BANK
0419  REP  11 LAST 1370      43,3654  27#374 1                ADS   SKEEP4
0420  REP  3  LAST 1370      43,3655  0 3660 1                TC    GONXTBNK
0421  REP  1                 43,3656  6 3235 0  NXTSUPR       AD    SUPRCON        SET BNK 30 + INCR SUPR BNK AND CANCEL
0422  REP  12 LAST 1370      43,3657  27#374 1                ADS   SKEEP4         ERC BIT OF THE 37 TO 40 ADVANCE.
0423  REP  22 LAST 1370      43,3660  11#377 1  GONXTBNK      CCS   SKEEP7
0424  REP  1                 43,3661  0 3523 0                TC    COMMFX
0425  REP  8  LAST 1370      43,3662  3 4712 1                CA    S+1
0426  REP  1                 43,3663  0 3541 1                TC    FXFX
0427  REP  1                 43,3664  3 4704 0                CA    SBIT7          HAS TO BE LARGER THAN NO OF FXSW BANKS.
0428  REP  2  LAST 1370      43,3665  0 3523 0                TC    COMMFX

0429  REP  13 LAST 1370      43,3666  3 1374 0  SOPTION       CA    SKEEP4
0430  REP  9  LAST 1370      43,3667  7 4364 0                MASK  HI5            = BANK BITS
0431  REP  5  LAST  349      43,3670  0 4345 1                TC    LEFT5
```

```
0432  REF 217  LAST 1369   43,3671  54 001 1          TS      L          BANK NUMBER BEFORE SUPER BANK
0433  REF  14  LAST 1370   43,3672  3 1374 0          CA      SKEEP4
0434  REF   1              43,3673  7 4373 0          MASK    S&BITS     = SUPER BANK BITS
0435                       43,3674  0 0006 1          EXTEND
0436  REF   1              43,3675  1 3703 1          BZF     SOPT       BEFORE SUPER BANK
0437  REF  32  LAST 1368   43,3676  54 021 0          TS      SR         SUPER BANK NECESSARY
0438  REF 218  LAST 1371   43,3677  3 0001 0          CA      L
0439  REF  19  LAST 1364   43,3700  7 4716 1          MASK    SEVEN
0440  REF  33  LAST 1371   43,3701  6 0021 1          AD      SR
0441  REF 219  LAST 1371   43,3702  54 001 1          TS      L          BANK NUMBER WITH SUPER BANK
0442  REF   6  LAST 1370   43,3703  3 1376 1  SOPT    CA      SKEEP6     *
0443                       43,3704  0 0006 1          EXTEND             *
0444                       43,3705  1 3707 0          BZF     +2         * ON -0 CONTINUE WITH ROPE CHECK.
0445  REF   1              43,3706  0 2762 0          TC      SDISPLAY   * ON +1 GO TO DISPLAY OF SUM.
0446  REF  18  LAST 1369   43,3707  11=371 1          CCS     SKEEP1     FORCE SUM TO ABSOLUTE VALUE.
04461                      43,3710  0 3712 0          TC      +2
04462                      43,3711  0 3713 1          TC      +2
04463 REF   9  LAST 1370   43,3712  6 4712 1          AD      S+1
04464 REF  19  LAST 1371   43,3713  55=371 1          TS      SKEEP1
0447  REF 220  LAST 1371   43,3714  4 0001 1  BNKCHK   CS      L          = - BANK NUMBER
0448  REF  20  LAST 1371   43,3715  6 1371 0          AD      SKEEP1
0449  REF   2  LAST 1370   43,3716  6 7716 0          AD      S-1
0450  REF   5  LAST 1368   43,3717  0 3271 0          TC      -1CHK      CHECK SUM
0451  REF   2  LAST  257   43,3720  0 3631 0          TC      NXTBNK

0454  REF  22  LAST 1370      0067                    EBANK=  NEWJOB
0455                       43,3721   66100 0  LSTBNKCH BBCON=  *          * CONSTANT, LAST BANK.
```

L PHASE TABLE MAINTENANCE USER=S PAGE NO. 1 E0 84

```
P0001          SUBROUTINE TO UPDATE THE PROGRAM NUMBER DISPLAY ON THE DSKY.

0002  REF  2 LAST  215 TO  216'    20    20*          COUNT  02/PHASE

0003                          5243                   BLOCK  02
0004  REF  2  LAST  215      4000                   SETLOC FFTAG1
0005                          5243                   BANK

0006  REF 306  LAST 1369      5243  50 002 0  NEWMODEX INDEX  Q
0007                          5244  3 0000 1          CAF    0
0008  REF 307  LAST 1372      5245  24 002 0          INCR   Q

0009  REF  15  LAST 1306      5246  55=011 1  NEWMODEA TS     MODREG        ENTRY FOR MODE IN A.
0014                          5247  3 5252 1  MMDSPLAY CAF    +3            DISPLAY MAJOR MODE.
0015  REF  31  LAST 1287      5250  22 006 1  PREBJUMP LXCH   BBANK         PUTS BBANK IN L
0016  REF   8  LAST 1299      5251  1 4577 1          TCF    BANKJUMP      PUTS Q INTO A
0017  REF   1                 5252   20344 0          CADR   SETUPDSP

R0018          RETURN TO CALLER +3 IF MODE = THAT AT CALLER +1. OTHERWISE RETURN TO CALLER +2.

0020  REF 308  LAST 1372      5253  50 002 0  CHECKMM  INDEX  Q
0021                          5254  4 0000 0          CS     0
0022  REF  16  LAST 1372      5255  6 1011 0          AD     MODREG
0023                          5256  0 0006 1          EXTEND
0024  REF   2  LAST 1180      5257  1 6710 0          BZF    Q+2
0025  REF   3  LAST  244      5260  1 6706 1          TCF    Q+1           NO MATCH

0026  REF   3  LAST 1372       6711            TCQ     =      Q+2 +1

0027                        14,3744                   BANK   14
0028  REF   1               10,2000                   SETLOC PHASETAB
0029                        10,2344                   BANK

0030  REF   1                                         COUNT  10/PHASE

0031                        10,2344  0 0004 0  SETUPDSP INHINT
0032  REF  25  LAST  782    10,2345  52 071 0          DXCH   RUPTREG1       SAVE CALLER-S RETURN 2CADR
0033  REF  14  LAST 1174    10,2346  3 4371 0          CAF    PRIO30           EITHER A TASK OR JOB CAN COME TO
0034  REF  31  LAST 1195    10,2347  0 5027 1          TC     NOVAC            NEWMODEX
0035  REF  17  LAST 1372       1011                   EBANK= MODREG
0036  REF   1               10,2350   03435 0          2CADR  DSPMMJOB
0036  REF   1               10,2351   60102 1
0037  REF  28  LAST 1372    10,2352  52 071 0          DXCH   RUPTREG1
0038                        10,2353  0 0003 1          RELINT
0039  REF  16  LAST  783    10,2354  52 006 0          DXCH   Z              RETURN

0040  REF   2  LAST  389    40,3435           DSPMMJOB EQUALS DSPMMJB
0041                          5261                   BLOCK  02
```

L PHASE TABLE MAINTENANCE

```
0042  REP  3  LAST 1372      4000          SETLOC FFTAG1
0043                         5261          BANK
```

P0044 PHASCHNG IS THE MAIN WAY OF MAKING PHASE CHANGES FOR RESTARTS. THERE ARE THREE FORMS OF PHASCHNG, KNOWN AS TYPE
R0046 A, TYPE B, AND TYPE C. THEY ARE ALL CALLED AS FOLLOWS, WHERE OCT XXXXX CONTAINS THE PHASE INFORMATION,

```
A0048
A0049                                   TC      PHASCHNG
                                        OCT     XXXXX
```

R0050 TYPE A IS CONCERNED WITH FIXED PHASE CHANGES, THAT IS, PHASE INFORMATIONTHAT IS STORED PERMANENTLY. THESE
R0052 OPTIONS ARE, WHERE G STANDS FOR A GROUP AND .X FOR THE PHASE,

```
R0053           G.0             INACTIVE, WILLNOT PERMIT A GROUP G RESTART
R0055           G.1             WILL CAUSE THE LAST DISPLAY TO BE REACTIVATED, USED MAINLY IN MANNED FLIGHTS
R0057           G.EVEN          A DOUBLE TABLE RESTART, CAN CAUSE ANY COMBINATION OF TWO JOBS, TASKS, AND/OR
R0059                           LONGCALL TO BE RESTARTED.
R0060           G.ODD NOT .1    A SINGLE TABLE RESTART, CAN CAUSE EITHER A JOB, TASK, OR LONGCALL RESTART
```

R0062 THIS INFORMATION IS PUT INTO THE OCTAL WORD AFTER TC PHASCHNG AS FOLLOWS

R0063 TL0 00P PPP PPP GGG

R0065 WHERE EACH LETTER OR NUMBER STANDS FOR A BIT. THE G'S STAND FOR THE GROUP, OCTAL 1 - 7, THE P'S FOR THE PHASE,
R0067 OCTAL 0 - 127. 0'S MUST BE 0. IF ONE WISHES TO HAVE THE TBASE OF GROUP G TO BE SET AT THIS TIME,
R0069 T IS SET TO 1, OTHERWISE IT IS SET TO 0. SIMIARLY IF ONE WISHES TO SET LONGBASE, THEN L IS SET TO 1, OTHERWISE
R0071 IT IS SET TO 0. SOME EXAMPLES,

```
A0072
A0073                                   TC      PHASCHNG        THIS WILL CAUSE GROUP 3 TOBE SET TO 0,
                                        OCT     00003           MAKING GROUP 3 INACTIVE
A0074
A0075                                   TC      PHASCHNG        IF A RESTART OCCURS THIS WOULD CAUSE
                                        OCT     00012           GROUP 2 TO RESTART THE LAST DISPLAY
A0076
A0077                                   TC      PHASCHNG        THIS SETS THE TBASE OF GROUP 4 AND IN
                                        OCT     40064           CASE OF A RESTART WOULD START UP THE TWO
A0078                                                           THINGS LOCATED IN THE DOUBLE 4.6 RESTART
A0079                                                           LOCATION
A0080                                   TC      PHASCHNG        THIS SETS LONGBASE AND UPON A RESTART
A0081                                   OCT     20135           CAUSES 5.13 TO BE RESTARTED (SINCE
A0082                                                           LONGBASE WAS SET THIS SINGLE ENTRY
A0083                                                           SHOULD BE A LONGCALL)
A0084                                   TC      PHASCHNG        SINCE BOTH TBASE4 AND LONGBASE ARE SET,
A0085                                   OCT     60124           4.12 SHOULD CONTAIN BOTH A TASK AND A
A0086                                                           LONGCALL TO BE RESTARTED
```

R0087 TYPE C PHASCHNG CONTAINS THE VARIABLE TYPE OF PHASCHNG INFORMATION. INSTEAD OF THE INFORMATION BEING IN A
R0089 PERMANENT FORM, ONE STORES THE DESIRED RESTART INFORMATION IN A VARIABKE LOCATION. THE BITS ARE AS FOLLOWS,

R0091 TL0 1AD XXX CJW GGG

R0092 WHERE EACH LETTER OR NUMBER STANDS FOR A BIT. THE G'S STAND FOR THE GROUP, OCTAL 1 - 7. IF THE RESTART IS TO
R0094 BE BY WAITLIST, W IS SET TO 1, IF IT IS A JOB, J IS SET TO 1, IF IT IS A LONGCALL, C IS SET TO 1. ONLY ONE OF
R0096 THESE THREE BIT S MAY BE SET. X'S ARE IGNORED 1 MUST BE 1, AND 0 MUST BE 0. AGAIN T STANDS FOR THE TBASE,

L PHASE TABLE MAINTENANCE

R0098 AND L FOR LONGBASE. THE BITS A AND D ARE CONCERNED WITH THE VARIABLE INFORMATION. IF D IS SET TO 1, A PRIORITY
R0100 OR DELTA TIME WILL BE READ FROM THE NEXT LOCATION AFTER THE OCTAL INFORMATION, IF THIS IS TO BE INDIRECT, THAT
R0102 IS, THE NAME OF A LOCATION COMTAINING THE INFORMATION (DELTA TIME ONLY), THEN THIS IS GIVEN AS THE -GENADR OF
R0104 THAT LOCATION WHICH CONTAINS THE DELTA TIME. IF THE OLD PRIORITY OR DELTA TIME IS TO BE USED, THAT WHICH IS
R0106 ALREADY IN THE VARIABLE STORAGE, THEN D IS SET TO 0. NEXT THE A BIT IS USED. IF IT IS SET TO 0, THE ADDRESS
R0108 THAT WOULD BE RESTARTED DURING A RESTART IS THE NEXT LOCATION AFTER THE PHASE INFORMATION, THAT IS, EITHER
R0110 (TC PHASCHNG) +2 OR +3, DEPENDING ON WHETHER D HAD BEEN SET OR NOT. IF A IS SET TO 1, THEN THE ADDRESS THAT
R0112 WOULD BE RESTARTED IS THE 2CADR THAT IS READ FROM THE NEXT TWO LOCATIONS. EXAMPLES,

```
A0114                  AD      TC      PHASCHNG    THIS WOULD CAUSE LOCATION AD +3 TO BE
A0115                  AD+1    OCT     05023       RESTARTED BY GROUP THREE WITHA PRIORITY
A0116                  AD+2    OCT     23000       OF 23.  NOTE UPON RETURNING IT WOULD
A0117                  AD+3                        ALSO GO TO AD+3

A0118                  AD      TC      PHASCHNG    GROUP 1 WOULD CAUSE CAUSE CALLCALL TO
A0119                  AD+1    OCT     27441       BE STARTED AS A LONGCALL FROM THE TIME
A0120                  AD+2    -GENADR DELTIME     STORED IN LONGBASE (LONGBASE WAS SET) BY
A0121                  AD+3    2CADR   CALLCALL    A DELTATIME STORED IN DELTIME.  THE
A0122                  AD+4                        BBCON OF THE 2CADR SHOULD CONTAIN THE E
A0123                  AD+5                        BANK OF DELTIME.  PHASCHNG RETURNS TO
A0124                                              LOCATION AD+5
```

R0125 NOTE THAT IF A VARIABLE PRIORITY IS GIVEN FOR A JOB, THE JOB WILL BE RESTARTED AS A NOVAC IF THE PRIORITY IS
R0127 NEGATIVE, AS A FINDVAC IF THE PRIORITY IS POSITIVE.
R0128 TYPE B PHASCHNG IS A COMBINATION OF VARIABLE AND FIXED PHASE CHANGES. IT WILL START UP A JOB AS INDICATED
R0130 BELOW AND ALSO START UP ONE FIXED RESTART, THAT IS EITHER AN G.1 OR A G.ODD OR THE FIRST ENTRY OF G.EVEN
R0132 DOUBLE ENTRY. THE BIT INFORMATION IS AS FOLLOWS,

R0133 TL_1 DAP PPP PPP GGG

R0134 WHERE EACH LETTER OR NUMBER STANDS FOR A BIT. THE G'S STAND FOR THE GROUP, OCTAL 1 - 7. THE P'S FOR THE FIXED
R0136 PHASE INFORMATION, OCTAL 0 - 127. 1 MUST BE 1. AND AGAIN T STANDS FOR THE TBASE AND L FOR LONGBASE. D THIS
R0138 TIME STANDS ONLY FOR PRIORITY SINCE THIS WILL BE CONSIDERED A JOB, AND IT MUST BE GIVEN DIRECTLY IF GIVEN.
R0140 AGAIN A STANDS FOR THE ADDRESS OF THE LOCATION TO BE RESTARTED, 1 IF THE 2CADR IS GIVEN , OR 0 IF IT IS TO BE
R0142 THE NEXT LOCATION.(THE RETURN LOCATION OF PHASCHNG) EXAMPLES,

```
A0143                  AD      TC      PHASCHNG    TBASE IS SET AND ARESTART CAUSE GROUP 3
A0144                  AD+1    OCT     56043       TO START THE JOB AJOBAJOB WITH PRIORITY
A0145                  AD+2    OCT     31000       31 AND THE FIRST ENTRY OF 3.4SPOT(WE CAN
A0146                  AD+3    2CADR   AJOBAJOB    ASSUME IT IS A TASK SINCE WE SET TBASE3)
A0147                  AD+4                        UPON RETURN FROM PHASCHNG CONTROL WOULD
A0148                  AD+5                        GO TO AD+5

A0149                  AD      TC      PHASCHNG    UPON A RESTART THE LAST DISPLAY WOULD BE
A0150                  AD+1    OCT     10015       RESTARTED AND A JOB WITH THE PREVIOUSLY
A0151                  AD+2                        STORED PRIORITY WOULD BE BEGUN AT AD+2
A0152                                              BY MEANS OF GROUP 5
```

R0153 THE NOVAC-FINDVAC CHOICE FOR JOBS HOLDS HERE ALSO - NEGATIVE PRIORITY CAUSES A NOVAC CALL, POSITIVE A FINDVAC.
R0155 SUMMARY OF BITS

R0156 TYPE A TL=0 00P PPP PPP GGG

R0157 TYPE B TL=1 DAP PPP PPP GGG

R0158 TYPE C TL=0 1AD XXX CJW GGG

L PHASE TABLE MAINTENANCE

P0159 2PHSCHNG IS USED WHEN ONE WISHES TO START UP A GROUP OR CHANGE A GROUP WHILE UNDER THE CONTROL OF A DIFFERENT
R0161 GROUP. FOR EXAMPLE, CHANGE THE PHASE OF GROUP 3 WHILE THE PORTION OF THE PROGRAM IS UNDER GROUP 5. ALL 2PHSCHNG
R0163 CALLS ARE MADE IN THE FOLLOWING MANNER,

```
A0164                                          TC      2PHSCHNG
A0165                                          OCT     XXXXX
A0166                                          OCT     YYYYY
```

R0167 WHERE OCT XXXXX MUST BE OF TYPE A AND OCT YYYYY MAY BE OF EITHER TYPE A OR TYPE B OR TYPEC. THERE IS ONE
R0169 DIFFERENCE --- NOTE- IF LONGBASE IS TO BE SET THIS INFORMATION IS GIVEN IN THE OCT YYYYY INFORMATION, IT WILL
R0171 BE DISREGARDED IF GIVEN WITH THE OCT XXXXX INFORMATION. A COUPLE OF EXAMPLES MAY HELP,

```
A0173                                  AD       TC      2PHSCHNG      SET TBASE3 AND IF A RESTART OCCURS START
A0174                                  AD+1     OCT     40083         THE TWO ENTRIES IN 3.8 TABLE LOCATION
A0175                                  AD+2     OCT     05025         THIS IS OF TYPE C, SET THE JOB TO BE
A0176                                  AD+3     OCT     18000         TO BE LOCATION AD+4, WITH A PRIORITY 18,
A0177                                  AD+4                           FOR GROUP 5 PHASE INFORMATION

 0178  REP   3 LAST 1372 TO 1372'    14    34*          COUNT   02/PHASE

 0179                          5261  0 0004 0  2PHSCHNG INHINT                 THE ENTRY FOR A DOUBLE PHASE CHANGE
 0180  REP 309  LAST 1372       5262  50 002 0          NDX     Q
 0181                          5263  3 0000 1          CA      0
 0182  REP 310  LAST 1377       5264  24 002 0          INCR    Q
 0183  REP   1                 5265  54 072 0          TS      TEMPP2

 0184  REP   1                 5266  7 4716 1          MASK    OCT7
 0185                          5267  6 0000 1          DOUBLE
 0186  REP   1                 5270  54 071 0          TS      TEMPG2

 0187  REP   2  LAST 1377       5271  3 0072 1          CA      TEMPP2
 0188  REP   1                 5272  7 4765 0          MASK    OCT17770      NEED ONLY 1770, BUT WHY GET A NEW CONST.
 0189                          5273  0 0006 1          EXTEND
 0190  REP  32  LAST 1363       5274  7 4677 1          MP      BIT12
 0191  REP   3  LAST 1377       5275  56 072 1          XCH     TEMPP2

 0192  REP  50  LAST 1363       5276  7 4674 1          MASK    BIT15
 0193  REP   1                 5277  54 066 0          TS      TEMPSW2       INDICATES WHETHER TO SET TBASE OR NOT

 0194  REP 100  LAST 1317       5300  1 5304 1          TCF     PHASCHNG +3
 0195                          5301  0 0004 0  PHASCHNG INHINT
 0196  REP 157  LAST 1338       5302  3 4712 1          CA      ONE           INDICATESWE CAME FROM A PHASCHNG ENTRY
 0197  REP   2  LAST 1377       5303  54 066 0          TS      TEMPSW2

 0198  REP 311  LAST 1377       5304  50 002 0          NDX     Q
 0199                          5305  3 0000 1          CA      0
 0200  REP 312  LAST 1377       5306  24 002 0          INCR    Q
 0201  REP   1                 5307  54 065 0          TS      TEMPSW
```

```
0202
0203   REP   1                  5310  0 0006 1          EXTEND
0204                            5311  3 5314 1          DCA     ADRPCHN2      OFF TO SWITCHED BANK
                                5312  52 006 0          DTCB

0205   REP  47  LAST 1384  E3,1400                      EBANK=  LST1
0206   REP   1                  5313   02355 0  ADRPCHN2 2CADR   PHSCHNG2
0206   REP   1                  5314   20103 1
0207   REP   1                  5315  22 073 0  ONEORTWO LXCH    TEMPBBCN
0208   REP  32  LAST 1372       5316  22 006 1           LXCH    BBANK
0209   REP   2  LAST 1378       5317  22 073 0           LXCH    TEMPBBCN

0210   REP   1                  5320  7 4761 1           MASK    OCT14000      SEE WHAT KIND OF PHASE CHANGE IT IS
0211   REP 351  LAST 1369       5321  10 000 0           CCS     A
0212   REP   1                  5322  1 5363 0           TCF     CHECKB        IT IS OF TYPE 'B'

0213   REP   1                  5323  3 0062 0           CA      TEMPP
0214   REP  54  LAST 1363       5324  7 4704 1           MASK    BIT7
0215   REP 352  LAST 1378       5325  10 000 0           CCS     A             SHALL WE USE THE OLD PRIORITY
0216   REP   1                  5326  1 5350 0           TCF     GETPRIO       NO GET A NEW PRIORITY (OR DELTA T)

0217   REP   4  LAST  215       5327  50 061 0  OLDPRIO  NDX     TEMPG         USE THE OLD PRIORITY (OR DELTA T)
0218   REP   1                  5330  3 1052 1           CA      PHSPRDT1 -2
0219   REP   1                  5331  54 070 1           TS      TEMPPR

0220   REP   2  LAST 1378       5332  3 0062 0  CON1     CA      TEMPP         SEE IF A 2CADR IS GIVEN
0221   REP  29  LAST 1363       5333  7 4703 0           MASK    BIT8
0222   REP 353  LAST 1378       5334  10 000 0           CCS     A
0223   REP   1                  5335  1 5354 1           TCF     GETNEWNM

0224   REP 313  LAST 1377       5336  3 0002 0           CA      Q
0225   REP   1                  5337  54 063 0           TS      TEMPNM
0226   REP   1                  5340  3 0006 1           CA      BB
0227                            5341  0 0006 1           EXTEND                PICK UP USERS SUPERBANK
0228   REP  23  LAST 1202       5342  04 007 1           ROR     SUPERBNK
0229   REP   1                  5343  54 064 1           TS      TEMPBB

0230   REP   1                  5344  3 5347 1  TOCON2   CA      CON2ADR       BACK TO SWITCHED BANK
0231   REP   3  LAST 1378       5345  22 073 0           LXCH    TEMPBBCN
0232                            5346  52 006 0           DTCB

0233   REP   1                  5347   02443 0  CON2ADR  GENADR  CON2

0234   REP 314  LAST 1378       5350  50 002 0  GETPRIO  NDX     Q             DON'T CARE IF DIRECT OR INDIRECT
0235                            5351  3 0000 1           CA      0             LEAVE THAT DECISION TO RESTARTS
0236   REP 315  LAST 1378       5352  24 002 0           INCR    Q             OBTAIN RETURN ADDRESS
0237   REP   1                  5353  1 5331 1           TCF     CON1 -1

0238                            5354  0 0006 1  GETNEWNM EXTEND
```

L PHASE TABLE MAINTENANCE

```
0239  REF 316  LAST 1378      5355  5 0002 0          INDEX  Q
0240                          5356  3 0001 0          DCA    0
0241  REF   2  LAST 1378      5357  52 064 1          DXCH   TEMPNM
0242  REF  68  LAST 1295      5360  3 4711 1          CA     TWO
0243  REF 317  LAST 1379      5361  26 002 1          ADS    Q        OBTAIN RETURN ADDRESS

0244  REF   1                 5362  1 5344 0          TCF    TOCON2

0245  REF   6  LAST  665      4761                OCT14000 EQUALS PRIO14
0246  REF  13  LAST 1335      0061                TEMPG    EQUALS ITEMP1
0247  REF  16  LAST 1335      0062                TEMPP    EQUALS ITEMP2
0248  REF   4  LAST   66      0063                TEMPNM   EQUALS ITEMP3
0249  REF   3  LAST   66      0064                TEMPBB   EQUALS ITEMP4
0250  REF   2  LAST   66      0065                TEMPSW   EQUALS ITEMP5
0251  REF   3  LAST  154      0066                TEMPSW2  EQUALS ITEMP6
0252  REF  27  LAST 1372      0070                TEMPPR   EQUALS RUPTREG1
0253  REF   6  LAST  145      0071                TEMPG2   EQUALS RUPTREG2
0254  REF   5  LAST 1075      0072                TEMPP2   EQUALS RUPTREG3

0255  REF   5  LAST 1075      0073                TEMPBBCN EQUALS RUPTREG4
0256  REF  33  LAST 1378      0006                BB       EQUALS BBANK
0257                        14,3744                       BANK   14
0258  REF   2  LAST 1372     10,2000                       SETLOC PHASETAB
0259                        10,2355                       BANK

0260  REF   1                E3,1436                      EBANK= PHSNAME1
0261  REF   2 LAST 1372 TO 1377'    9     9*             COUNT  10/PHASE

0262  REF   4  LAST 1378     10,2355  22 073 0  PHSCHNG2  LXCH   TEMPBBCN
0263  REF   2  LAST 1377     10,2356  3 0065 1            CA     TEMPSW
0264  REF   2  LAST 1377     10,2357  7 4716 1            MASK   OCT7
0265                        10,2360  6 0000 1            DOUBLE
0266  REF   5  LAST 1378     10,2361  54 061 1            TS     TEMPG

0267  REF   3  LAST 1379     10,2362  3 0065 1            CA     TEMPSW
0268  REF   2  LAST 1377     10,2363  7 4765 0            MASK   OCT17770
0269                        10,2364  0 0006 1            EXTEND
0270  REF  33  LAST 1377     10,2365  7 4677 1            MP     BIT12
0271  REF   3  LAST 1378     10,2366  54 062 1            TS     TEMPP

0272  REF   4  LAST 1379     10,2367  3 0065 1            CA     TEMPSW
0273  REF  14  LAST  904     10,2370  7 4105 0            MASK   OCT60000
0274  REF   5  LAST 1379     10,2371  56 065 1            XCH    TEMPSW
0275  REF   2  LAST 1378     10,2372  7 4761 1            MASK   OCT14000
0276  REF 354  LAST 1378     10,2373  10 000 0            CCS    A

0277  REF   1                10,2374  1 5315 1            TCF    ONEORTWO
```

L PHASE TABLE MAINTENANCE


```
0278  REF   4  LAST 1379   10,2375  3 0062 0            CA    TEMPP          START STORING THE PHASE INFORMATION
0279  REF   6  LAST 1379   10,2376  50 061 0            NDX   TEMPG
0280  REF   2  LAST  185   10,2377  54 751 0            TS    PHASE1 -2

0281  REF   3  LAST 1377   10,2400  10 066 0  BELOW1    CCS   TEMPSW2        IS IT A PHASCHNG OR A 2PHSCHNG
0282  REF   1               10,2401  1 2415 1            TCF   BELOW2         IT'S A PHASCHNG
0283                        10,2402  1 2403 0            TCF   +1            IT'S A 2PHSCHNG
0284  REF   4  LAST 1377   10,2403  4 0072 0            CS    TEMPP2
0285  REF   5  LAST 1380   10,2404  22 072 1            LXCH  TEMPP2
0286  REF   2  LAST 1377   10,2405  50 071 1            NDX   TEMPG2
0287  REF   5  LAST  215   10,2406  52 751 0            DXCH  -PHASE1 -2

0288  REF   4  LAST 1380   10,2407  10 066 0            CCS   TEMPSW2
0289                        10,2410  12 411 0            NOOP
0290  REF   2  LAST 1380   10,2411  1 2415 1            TCF   BELOW2         CAN'T GET HERE

0291  REF  19  LAST 1071   10,2412  4 0025 1            CS    TIME1
0292  REF   3  LAST 1380   10,2413  50 071 1            NDX   TEMPG2
0293  REF   4  LAST  385   10,2414  55=051 0            TS    TBASE1 -2

0294  REF   6  LAST 1379   10,2415  10 065 0  BELOW2    CCS   TEMPSW         SEE IF WE SHOULD SET TBASE OR LONGBASE
0295  REF   1               10,2416  1 2431 1            TCF   BELOW3         SET LONGBASE ONLY
0296  REF   1               10,2417  1 2434 1            TCF   BELOW4         SET NEITHER

0297  REF  20  LAST 1380   10,2420  4 0025 1            CS    TIME1          SET TBASE TO BEGIN WITH
0298  REF   7  LAST 1380   10,2421  50 061 0            NDX   TEMPG
0299  REF   5  LAST 1380   10,2422  55=051 0            TS    TBASE1 -2

0300  REF   7  LAST 1380   10,2423  3 0065 1            CA    TEMPSW         SHALL WE NOW SET LONGBASE
0301  REF   1               10,2424  6 2427 1            AD    BIT14COM
0302  REF 355  LAST 1379   10,2425  10 000 0            CCS   A
0303                        10,2426  12 427 0            NOOP
0304                        10,2427   17777 0  BIT14COM CCT   17777          ***** CANT GET HERE *****
0305  REF   2  LAST 1380   10,2430  1 2434 1            TCF   BELOW4         ***** CANT GET HERE *****
                                                                             NO WE NEED ONLY SET TBASE
0306                        10,2431  0 0006 1  BELOW3    EXTEND
0307  REF  29  LAST 1299   10,2432  3 0025 0            DCA   TIME2          SET LONGBASE
0308  REF   1               10,2433  53=136 0            DXCH  LONGBASE

0309  REF   5  LAST 1380   10,2434  4 0062 1  BELOW4    CS    TEMPP          AND STORE THE FINAL PART OF THE PHASE
0310  REF   8  LAST 1380   10,2435  50 061 0            NDX   TEMPG
0311  REF   6  LAST 1380   10,2436  54 750 1            TS    -PHASE1 -2

0312  REF 318  LAST 1379   10,2437  3 0002 0            CA    0
0313  REF   5  LAST 1379   10,2440  22 073 0            LXCH  TEMPBBCN
0314                        10,2441  0 0003 1            RELINT
0315                        10,2442  52 006 0            DTCB
0316  REF   6  LAST 1380   10,2443  22 073 0  CON2      LXCH  TEMPBBCN
```

L PHASE TABLE MAINTENANCE

```
0317  REP  6  LAST 1380   10,2444  3 0062 0      CA    TEMPP
0318  REP  9  LAST 1380   10,2445  50 061 0      NDX   TEMPG
0319  REP  3  LAST 1380   10,2446  54 751 0      TS    PHASE1 -2

0320  REP  2  LAST 1378   10,2447  3 0070 0      CA    TEMPPR
0321  REP 10  LAST 1381   10,2450  50 061 0      NDX   TEMPG
0322  REP  2  LAST 1378   10,2451  55=052 0      TS    PHSPRDT1 -2

0323                       10,2452  0 0006 1      EXTEND
0324  REP  3  LAST 1379   10,2453  3 0064 0      DCA   TEMPNM
0325  REP 11  LAST 1381   10,2454  50 061 0      NDX   TEMPG
0326  REP  2  LAST 1379   10,2455  53=435 0      DXCH  PHSNAME1 -2

0327  REP  1               10,2456  1 2400 0      TCF   BELOW1

0328                          5363               BLOCK 02
0329  REP  4  LAST 1373       4000               SETLOC FFTAG1
0330                          5363               BANK

0331  REP  4 LAST 1377 TO 1379'    66   100*     COUNT 02/PHASE

0332  REP 34  LAST 1379      5363  7 4677 1  CHECKB  MASK  BIT12     SINCE THIS IS OF TYPE B, THIS BIT SHOULD
0333  REP 356 LAST 1380      5364  10 000 0        CCS   A           BE HERE IF WE ARE TO GET A NEW PRIORITY
0334  REP  2  LAST 1378      5365  1 5350 0        TCF   GETPRIO     IT IS, SO GET NEW PRIORITY

0335  REP  1                  5366  1 5327 0        TCF   OLDPRIO     IT ISN'T, USE THE OLD PRIORITY
```

```
0001                          01,3520                    BANK    01
0002   REF   2  LAST  206     01,2000                    SETLOC  RESTART
0003                          01,3520                    BANK

0004   REF   3  LAST 1381     E3,1436                    EBANK=  PHSNAME1      GOPROG MUST SWITCH TO THIS EBANK

0005   REF   1                                          COUNT   01/RSROU

0006   REF 668  LAST 1338     01,3520  3 0161 1 RESTARTS CA      MPAC +5      GET GROUP NUMBER -1
0007                          01,3521  6 0000 1          DOUBLE                SAVE FOR INDEXING
0008   REF   1                01,3522  54 155 1          TS      TEMP2G

0009   REF   1                01,3523  3 3762 1          CA      PHS2CADR     SET UP EXIT IN CASE IT IS AN EVEN
0010   REF   1                01,3524  54 157 0          TS      TEMPSWCH     TABLE PHASE

0011   REF   1                01,3525  3 3557 0          CA      RTRNCADR     TO SAVE TIME ASSUME IT WILL GET NEXT
0012   REF   1                01,3526  54 707 0          TS      GOLOC +2     GROUP AFTER THIS

0013   REF   1                01,3527  3 0154 1          CA      TEMPPHS
0014   REF   9  LAST 1364     01,3530  7 4744 0          MASK    OCT1400
0015   REF 357  LAST 1381     01,3531  10 000 0          CCS     A            IS IT A VARIABLE OR TABLE RESTART
0016   REF   1                01,3532  1 3543 1          TCF     ITSAVAR      IT'S A VARIABLE RESTART

0017   REF   2  LAST 1382     01,3533  10 154 0 GETPART2 CCS     TEMPPHS      IS IT AN X.1 RESTART
0018   REF 358  LAST 1382     01,3534  10 000 0          CCS     A
0019   REF   1                01,3535  1 3643 1          TCF     ITSATBL      NO, ITS A TABLE RESTART

0020   REF   7  LAST 1379     01,3536  3 4761 0          CA      PRIO14       IT IS AN X.1 RESTART, THEREFORE START
0021   REF  31  LAST 1283     01,3537  0 5042 1          TC      FINDVAC      THE DISPLAY RESTART JOB
0022   REF  48  LAST 1378     E3,1400                    EBANK=  LST1
0023   REF   1                01,3540   03165 0          2CADR   INITDSP
0023   REF   1                01,3541   20103 1

0024   REF   2  LAST 1382     01,3542  0 3557 0          TC      RTRNCADR     FINISHED WITH THIS GROUP, GET NEXT ONE

0025   REF  10  LAST 1382     01,3543  7 4744 0 ITSAVAR  MASK    OCT1400      IS IT TYPE B ?
0026   REF 359  LAST 1382     01,3544  10 000 0          CCS     A
0027   REF   1                01,3545  1 3614 0          TCF     ITSLIKEB     YES, IT IS TYPE B

0028                          01,3546  0 0006 1          EXTEND               STORE THE JOB (OR TASK) 2CADR FOR EXIT
0029   REF   2  LAST 1382     01,3547  5 0155 0          NDX     TEMP2G
0030   REF   4  LAST 1382     01,3550  3 1437 0          DCA     PHSNAME1
0031   REF   2  LAST 1382     01,3551  52 706 1          DXCH    GOLOC

0032   REF   3  LAST 1382     01,3552  3 0154 1          CA      TEMPPHS      SEE IF THIS IS A JOB, TASK, OR A LONGCAL
0033   REF   3  LAST 1379     01,3553  7 4716 1          MASK    OCT7
0034   REF   3  LAST 1228     01,3554  6 7715 0          AD      MINUS2
0035   REF 360  LAST 1382     01,3555  10 000 0          CCS     A
0036   REF   1                01,3556  1 3726 0          TCF     ITSLNGCL     ITS A LONGCALL
```

L RESTARTS ROUTINE USER-S PAGE NO. 2 E3 S4

```
0037  REF   6  LAST  298    01,3557  0 4570 1  RTRNCADR TC    SWRETURN     CANT GET HERE
0038  REF   1               01,3560  1 3562 1           TCF   ITSAWAIT

0039  REF   1               01,3561  1 3627 0           TCF   ITSAJOB      ITS A JOB

0040  REF   1               01,3562  3 3766 0  ITSAWAIT CA    WTLTCADR     SET UP WAITLIST CALL
0041  REF   3  LAST 1382    01,3563  54 704 0           TS    GOLOC -1

0042  REF   3  LAST 1382    01,3564  50 155 0           NDX   TEMP2G       DIRECTLY STORED
0043  REF   3  LAST 1381    01,3565  3 1054 1           CA    PHSPRDT1
0044  REF 361  LAST 1382    01,3566  10 000 0  TIMETEST CCS   A            IS IT AN IMMEDIATE RESTART
0045  REF 362  LAST 1383    01,3567  24 000 1           INCR  A            NO,
0046  REF   1               01,3570  1 3573 1           TCF   FINDTIME     FIND OUT WHEN IT SHOULD BEGIN

0047  REF   1               01,3571  1 5367 1           TCF   ITSINDIR     STORED INDIRECTLY

0048  REF   1               01,3572  1 3612 0           TCF   IMEDIATE     IT WANTS AN IMMEDIATE RESTART

R0049 ***** THIS MUST BE IN FIXED FIXED *****

0050                          5367                     BLOCK 02
0051  REF   2  LAST  622      4000                     SETLOC FFTAG2
0052                          5367                     BANK

0053  REF   1                                          COUNT 02/RSRCU

0054  REF   4  LAST 1383      5367  22 706 0  ITSINDIR LXCH  GOLOC +1      GET THE CORRECT E BANK IN CASE THIS IS
0055  REF   2  LAST 1378      5370  22 006 1           LXCH  BB             SWITCHED ERRASIBLE

0056  REF 363  LAST 1383      5371  50 000 1           NDX   A             GET THE TIME INDIRECTLY
0057                          5372  3 0001 0           CA    1

0058  REF   3  LAST 1383      5373  22 006 1           LXCH  BB             RESTORE THE BB AND GOLOC
0059  REF   5  LAST 1383      5374  22 706 0           LXCH  GOLOC +1

0060  REF   2  LAST 1383      5375  1 3573 1           TCF   FINDTIME       FIND OUT WHEN IT SHOULD BEGIN

R0061 ***** YOU MAY RETURN TO SWITCHED FIXED *****

0062                        01,3573                    BANK  01
0063  REF   3  LAST 1382    01,2000                    SETLOC RESTART
0064                        01,3573                    BANK

0065  REF   2 LAST 1382 TO 1383'    43    43*         COUNT 01/RSRCU

0066                        01,3573  4 0000 0  FINDTIME COM
0067  REF 221  LAST 1371    01,3574  54 001 1           TS    L              MAKE NEGITIVE SINCE IT WILL BE SUBTRACTD
0068  REF   4  LAST 1383    01,3575  50 155 0           NDX   TEMP2G         AND SAVE
0069  REF   6  LAST 1380    01,3576  4 1053 1           CS    TBASE1
0070                        01,3577  0 0006 1           EXTEND
```

L RESTARTS ROUTINE

```
0071  REP  21  LAST 1380   01,3600  60 025 0            SU    TIME1
0072  REP 364  LAST 1383   01,3601  10 000 0            CCS   A
0073                       01,3602  4 0000 0            COM
0074  REP   4  LAST  918   01,3603  6 7700 1            AD    OCT37776
0075  REP 158  LAST 1377   01,3604  6 4712 1            AD    ONE
0076  REP 222  LAST 1383   01,3605  6 0001 0            AD    L
0077  REP 365  LAST 1384   01,3606  10 000 0            CCS   A
0078  REP 253  LAST 1363   01,3607  3 4714 1            CA    ZERO
0079                       01,3610  1 3612 0            TCF   +2
0080                       01,3611  1 3612 0            TCF   +1
0081  REP 159  LAST 1384   01,3612  6 4712 1 IMEDIATE   AD    ONE
0082  REP   6  LAST 1383   01,3613  0 0704 1            TC    GOLOC -1
0083  REP   3  LAST 1382   01,3614  3 3557 0 ITSLIKEB   CA    RTRNCADR      TYPE B,          SO STORE RETURN IN
0084  REP   2  LAST 1382   01,3615  54 157 0            TS    TEMPSWCH      TEMPSWCH IN CASE OF AN EVEN PHASE

0085  REP   1              01,3616  3 3763 0            CA    PRT2CADR      SET UP EXIT TO GET TABLE PART OF THIS
0086  REP   7  LAST 1384   01,3617  54 707 0            TS    GOLOC +2      VARIABLE TYPE OF PHASE

0087  REP   4  LAST 1382   01,3620  3 0154 1            CA    TEMPPHS       MAKE THE PHASE LOOK RIGHT FOR THE TABLE
0088  REP   1              01,3621  7 6043 1            MASK  OCT177        PART OF THIS VARIABLE PHASE
0089  REP   5  LAST 1384   01,3622  54 154 0            TS    TEMPPHS

0090                       01,3623  0 0006 1            EXTEND
0091  REP   5  LAST 1383   01,3624  5 0155 0            NDX   TEMP2G        OBTAIN THE JOB'S 2CADR
0092  REP   5  LAST 1382   01,3625  3 1437 0            DCA   PHSNAME1
0093  REP   8  LAST 1384   01,3626  52 706 1            DXCH  GOLOC

0094  REP   6  LAST 1384   01,3627  50 155 0 ITSAJOB    NDX   TEMP2G        NOW ADD THE PRIORITY AND LET'S GO
0095  REP   4  LAST 1383   01,3630  3 1054 1            CA    PHSPRDT1
0096  REP   9  LAST 1384   01,3631  54 704 0 CHKNOVAC   TS    GOLOC -1      SAVE PRIO UNTIL WE SEE IF ITS
0097                       01,3632  0 0006 1            EXTEND              A FINDVAC OR A NOVAC
0098  REP   1              01,3633  6 3637 0            BZMF  ITSNOVAC

0099  REP   1              01,3634  3 3765 0            CAF   FVACCADR      POSITIVE, SET UP FINDVAC CALL.
0100  REP  10  LAST 1384   01,3635  56 704 1            XCH   GOLOC -1      PICK UP PRIO,
0101  REP  11  LAST 1384   01,3636  0 0704 1            TC    GOLOC -1      AND GO

0102  REP   1              01,3637  3 3767 1 ITSNOVAC   CAF   NOVACADR      NEGATIVE,
0103  REP  12  LAST 1384   01,3640  56 704 1            XCH   GOLOC -1      SET UP NOVAC CALL,
0104                       01,3641  4 0000 0            COM                 CORRECT PRIO,
0105  REP  13  LAST 1384   01,3642  0 0704 1            TC    GOLOC -1      AND GO

0106  REP  45  LAST 1368   01,3643  54 020 1 ITSATBL    TS    CYR           FIND OUT IF THE PHASE IS ODD OR EVEN
0107  REP  46  LAST 1384   01,3644  10 020 1            CCS   CYR
0108                       01,3645  1 3646 1            TCF   +1            IT'S EVEN
0109  REP   1              01,3646  1 3744 1            TCF   ITSEVEN

0110  REP   4  LAST 1384   01,3647  3 3557 0            CA    RTRNCADR      IN CASE THIS IS THE SECOND PART OF A
0111  REP  14  LAST 1384   01,3650  54 707 0            TS    GOLOC +2      TYPE B RESTART, WE NEED PROPER EXIT
```

E. RESTARTS ROUTINE

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0112  REF   6  LAST 1384   01,3651  3 0154 1          CA     TEMPPHS     SET UP POINTER FOR FINDING OUR PLACE IN
0113  REF  34  LAST 1371   01,3652  54 021 0          TS     SR          THE RESTART TABLES
0114  REF  35  LAST 1385   01,3653  6 0021 1          AD     SR
0115  REF   7  LAST 1384   01,3654  50 155 0          NDX    TEMP2G
0116  REF   1              01,3655  6 2001 1          AD     SIZETAB +1
0117  REF   1              01,3656  54 156 1          TS     POINTER

0118                       01,3657  0 0006 1  CONTBL2  EXTEND              FIND OUT WHAT'S IN THE TABLE
0119  REF   2  LAST 1385   01,3660  5 0156 0          NDX    POINTER
0120  REF   1              01,3661  3 2002 1          DCA    CADRTAB      GET THE 2CADR

0121  REF  15  LAST 1384   01,3662  22 706 0          LXCH   GOLOC +1     STORE THE BB INFORMATION

0122  REF 366  LAST 1384   01,3663  10 000 0          CCS    A            IS IT A JOB OR IS IT  TIMED
0123  REF 367  LAST 1385   01,3664  24 000 1          INCR   A            POSITIVE, MUST BE A JOB
0124  REF   1              01,3665  1 3740 0          TCF    ITSAJOB2

0125  REF 368  LAST 1385   01,3666  24 000 1          INCR   A            MUST BE EITHER A WAITLIST OR LONGCALL
0126  REF  16  LAST 1385   01,3667  54 705 1          TS     GOLOC        LET-S STORE THE CORRECT CADR

0127  REF   2  LAST 1383   01,3670  3 3766 0          CA     WTLTCADR     SET UP OUR EXIT TO WAITLIST
0128  REF  17  LAST 1385   01,3671  54 704 0          TS     GOLOC -1

0129  REF  18  LAST 1385   01,3672  3 0706 0          CA     GOLOC +1     NOW FIND OUT IF IT IS A WAITLIST CALL
0130  REF  38  LAST 1383   01,3673  7 4701 1          MASK   BIT10        THIS SHOULD BE ONE IF WE HAVE -BB
0131  REF 369  LAST 1385   01,3674  10 000 0          CCS    A            FOR THAT MATTER SO SHOULD BE BITS 9,8,7,
A0132                                                                     6,5, AND LAST BUT NOT LEAST (PERHAPS NOT
A0133                                                                     IN IMPORTANCE ANYWAY. BIT 4
0134  REF   1              01,3675  1 3733 1          TCF    ITSWTLST     IT IS A WAITLIST CALL

0135  REF   3  LAST 1385   01,3676  50 156 0          NDX    POINTER      OBTAIN THE ORIGINAL DELTA T
0136  REF   1              01,3677  3 2000 0          CA     PRDTTAB      ADDRESS FOR THIS LONGCALL

0137  REF   1              01,3700  1 5378 1          TCF    ITSLGCL1     NOW GO GET THE DELTA TIME

R0138 ***** THIS MUST BE IN FIXED FIXED *****

0139                          5376                   BLOCK  02
0140  REF   3  LAST 1383     4000                   SETLOC FFTAG2
0141                          5376                   BANK

0142  REF   2 LAST 1383 TO 1383'    7     7*        COUNT  02/RSROU

0143  REF  19  LAST 1385      5376  22 706 0  ITSLGCL1 LXCH  GOLOC +1     OBTAIN THE CORRECT E BANK
0144  REF   4  LAST 1383      5377  22 006 1          LXCH   BB
0145  REF  20  LAST 1385      5400  22 706 0          LXCH   GOLOC +1     AND PRESERVE OUR E AND F BANKS

0146                          5401  0 0006 1          EXTEND               GET THE DELTA TIME
0147  REF 370  LAST 1385      5402  5 0000 1          NDX    A
0148                          5403  3 0001 0          DCA    0
```

L RESTARTS ROUTINE

USER-S PAGE NO. 5 E3 S4

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0149  REP 21 LAST 1385      5404  22 706 0          LXCH  GOLOC +1     RESTORE OUR E AND F BANK
0150  REP  5 LAST 1385      5405  22 006 1          LXCH  BB           RESTORE THE TASKS E AND F BANKS
0151  REP 22 LAST 1386      5406  22 706 0          LXCH  GOLOC +1     AND PRESERVE OUR L

0152  REP  1                5407  1 3701 0          TCF   ITSLGCL2    NOW LET'S PROCESS THIS LONGCALL

R0153 ***** YOU MAY RETURN TO SWITCHED FIXED *****

0154                        01,3701                 BANK  01
0155  REP  4 LAST 1383      01,2000                 SETLOC RESTART
0156                        01,3701                 BANK

0157  REP  3 LAST 1383 TO 1385'   70   113*        COUNT 01/RSROU

0158  REP  6 LAST 1204      01,3701  53=140 1 ITSLGCL2 DXCH  LONGTIME

0159                        01,3702  0 0006 1          EXTEND
0160  REP 30 LAST 1380      01,3703  4 0025 1          DCS   TIME2        CALCULATE TIME LEFT
0161  REP  7 LAST 1386      01,3704  21=140 1          DAS   LONGTIME
0162                        01,3705  0 0006 1          EXTEND
0163  REP  2 LAST 1380      01,3706  3 1136 1          DCA   LONGBASE
0164  REP  8 LAST 1386      01,3707  21=140 1          DAS   LONGTIME

0165  REP  9 LAST 1386      01,3710  11=137 1          CCS   LONGTIME     FIND OUT HOW THIS SHOULD BE RESTARTED
0166  REP  1                01,3711  1 3721 1          TCF   LONGCLCL
0167                        01,3712  1 3714 1          TCF   +2
0168  REP  2 LAST 1383      01,3713  1 3607 1          TCF   IMEDIATE -3
0169  REP 10 LAST 1386      01,3714  11=140 1          CCS   LONGTIME +1
0170  REP  2 LAST 1386      01,3715  1 3721 1          TCF   LONGCLCL
0171                        01,3716  13 717 1          NOOP                CAN'T GET HERE  *********
0172  REP  3 LAST 1386      01,3717  1 3607 1          TCF   IMEDIATE -3
0173  REP  4 LAST 1386      01,3720  1 3612 0          TCF   IMEDIATE

0174  REP  1                01,3721  3 3764 1 LONGCLCL CA    LGCLCADR    WE WILL GO TO LONGCALL
0175  REP 23 LAST 1386      01,3722  54 704 0          TS    GOLOC -1

0176                        01,3723  0 0006 1          EXTEND              PREPARE OUR ENTRY TO LONGCALL
0177  REP 11 LAST 1386      01,3724  3 1140 0          DCA   LONGTIME
0178  REP 24 LAST 1386      01,3725  0 0704 1          TC    GOLOC -1

0179  REP  3 LAST 1385      01,3726  3 3766 0 ITSLNGCL CA    WTLTCADR    ASSUME IT WILL GO TO WAITLIST
0180  REP 25 LAST 1386      01,3727  54 704 0          TS    GOLOC -1

0181  REP  8 LAST 1385      01,3730  50 155 0          NDX   TEMP2G
0182  REP  5 LAST 1384      01,3731  4 1054 0          CS    PHSPRDT1    GET THE DELTA T ADDRESS

0183  REP  2 LAST 1385      01,3732  1 5376 1          TCF   ITSLGCL1    NOW GET THE DELTA TIME

0184  REP 26 LAST 1386      01,3733  4 0706 1 ITSWTLST CS    GOLOC +1    CORRECT THE BBCON INFORMATION
0185  REP 27 LAST 1386      01,3734  54 706 1          TS    GOLOC +1
```

L RESTARTS ROUTINE USER'S PAGE NO. 6 E3 S4

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0186  REF   4  LAST 1385   01,3735  50 156 0          NDX   POINTER    GET THE DT AND FIND OUT IF IT WAS STORED
0187  REF   2  LAST 1385   01,3736  3 2000 0          CA    PRDTTAB    DIRECTLY OR INDIRECTLY

0188  REF   1              01,3737  1 3566 0          TCF   TIMETEST   FIND OUT HOW THE TIME IS STORED

0189  REF  28  LAST 1386   01,3740  56 705 0  ITSAJOB2 XCH   GOLOC     STORE THE CADR

0190  REF   5  LAST 1387   01,3741  50 156 0          NDX   POINTER    ADD THE PRIORITY AND LET'S GO
0191  REF   3  LAST 1387   01,3742  3 2000 0          CA    PRDTTAB

0192  REF   1              01,3743  1 3631 1          TCF   CHKNOVAC

0193  REF   3  LAST 1384   01,3744  3 0157 1  ITSEVEN  CA    TEMPSWCH   SET UP FOR EITHER THE SECOND PART OF THE
0194  REF  29  LAST 1387   01,3745  54 707 0          TS    GOLOC +2   TABLE, OR A RETURN FOR THE NEXT GROUP

0195  REF   9  LAST 1386   01,3746  50 155 0          NDX   TEMP2G     SET UP POINTER FOR OUR LOCATION WITHIN
0196  REF   2  LAST 1385   01,3747  3 2000 0          CA    SIZETAB    THE TABLE
0197  REF   7  LAST 1385   01,3750  6 0154 1          AD    TEMPPHS    THIS MAY LOOK BAD BUT LET'S SEE YOU DO
0198  REF   8  LAST 1387   01,3751  6 0154 1          AD    TEMPPHS    BETTER IN TIME OR NUMBERR OF LOCATIONS
0199  REF   9  LAST 1387   01,3752  6 0154 1          AD    TEMPPHS
0200  REF   6  LAST 1387   01,3753  54 156 1          TS    POINTER

0201  REF   1              01,3754  1 3657 1          TCF   CONTBL2    NOW PROCESS WHAT IS IN THE TABLE

0202  REF  46  LAST 1363   01,3755  3 6214 0  PHSPART2 CA    THREE      SET THE POINTER FOR THE SECOND HALF OF
0203  REF   7  LAST 1387   01,3756  26 156 1          ADS   POINTER    THE TABLE

0204  REF   5  LAST 1384   01,3757  3 3557 0          CA    RTRNCADR   THIS WILL BE OUR LAST TIME THROUGH THE
0205  REF  30  LAST 1387   01,3760  54 707 0          TS    GOLOC +2   EVEN TABLE , SO AFTER IT  GET THE NEXT
A0206                                                               GROUP
0207  REF   2  LAST 1387   01,3761  1 3657 1          TCF   CONTBL2    SO LET'S GET THE SECOND ENTRY IN THE TBL

0208  REF 669  LAST 1382      0154           TEMPPHS  EQUALS MPAC
0209  REF 670  LAST 1387      0155           TEMP2G   EQUALS MPAC +1
0210  REF 671  LAST 1387      0156           POINTER  EQUALS MPAC +2
0211  REF 672  LAST 1387      0157           TEMPSWCH EQUALS MPAC +3
0212  REF   1                 0705           GOLOC    EQUALS VAC5 +20D
0213  REF   7  LAST 1364      7715           MINUS2   EQUALS NEG2
0214  REF   9  LAST 1185      6043           OCT177   EQUALS LOW7
0215  REF   1              01,3762  03755 0  PHS2CADR GENADR PHSPART2
0216  REF   1              01,3763  03533 1  PRT2CADR GENADR GETPART2
0217  REF   4  LAST 1284   01,3764  05231 1  LGCLCADR GENADR LONGCALL
0218  REF  32  LAST 1382   01,3765  05042 1  FVACCADR GENADR FINDVAC
0219  REF  52  LAST 1205   01,3766  05140 1  WTLTCADR GENADR WAITLIST
0220  REF  32  LAST 1372   01,3767  05027 1  NOVACADR GENADR NOVAC
```

L IMU MODE SWITCHING ROUTINES USER=S PAGE NO. 1 E0 S4

```
0001                        5410                    BLOCK  02
0002  REF   1               4000                    SETLOC FFTAG3
0003                        5410                    BANK

0004  REF   1             E3,1471                   EBANK= COMMAND

R0005          FIXED-FIXED ROUTINES.

0006  REF   1                                       COUNT  02/IMODE

0007  REF 254  LAST 1384   5410  3 4714 1  ZEROICDU CAF    ZERO        ZERO ICDU COUNTERS.
0008  REF  29  LAST 1333   5411  54 032 1            TS     CDUX
0009  REF  17  LAST 1333   5412  54 033 0            TS     CDUY
0010  REF  23  LAST 1334   5413  54 034 1            TS     CDUZ
0011  REF 319  LAST 1380   5414  0 0002 0            TC     Q

0012  REF  33  LAST 1363   4702              SPSCODE =      BIT9
```

L IMU MODE SWITCHING ROUTINES

P0013 IMU ZEROING ROUTINE.

```
0014                        11,3721                          BANK    11
0015   REP  1               07,2000                          SETLOC  MODESW
0016                        07,2516                          BANK

0017   REP  1                                                COUNT   07/IMODE

0018                        07,2516  0 0004 0  IMUZERO  INHINT                  ROUTINE TO ZERO ICDUS.
0019   REP  41  LAST  382   07,2517  4 1036 1           CS      DSPTAB +11D     DONT ZERO CDUS IF IMU IN GIMBAL LOCK AND
0020   REP  4   LAST  180   07,2520  7 4726 1           MASK    BITS4d6         COARSE ALIGN (GIMBAL RUNAWAY PROTECTION)
0021   REP  371 LAST 1385   07,2521  10 000 0           CCS     A
0022   REP  1               07,2522  1 2526 0           TCF     IMUZEROA

0023   REP  37  LAST 1328   07,2523  0 5537 0           TC      ALARM           IF SO.
0024                        07,2524   00206 0           OCT     00206

0025   REP  1               07,2525  1 3461 0           TCF     CAGETSTJ +4     IMMEDIATE FAILURE.

0032   REP  2   LAST 1389   07,2526  0 3455 0  IMUZEROA TC      CAGETSTJ
R0033                                DO ALL THE WORK.
0034   REP  29  LAST 1034   07,2527  4 1321 1           CS      IMODES33        DISABLE DAP AUTO AND HOLD MODES
0035   REP  2   LAST  526   07,2530  7 4730 0           MASK    SUPER011            BIT5 FOR GROUND
0036   REP  30  LAST 1389   07,2531  27=321 1           ADS     IMODES33

0037   REP  43  LAST  721   07,2532  4 1320 0           CS      IMODES30        INHIBIT ICDUFAIL AND IMUFAIL (IN CASE WE
0038   REP  1               07,2533  7 5656 0           MASK    BITS3d4         JUST CAME OUT OF COARSE ALIGN).
0039   REP  44  LAST 1389   07,2534  27=320 0           ADS     IMODES30

0040   REP  5   LAST 1389   07,2535  4 4726 1           CS      BITS4d6         SEND ZERO ENCODE WITH COARSE AND ERROR
0041                        07,2536  0 0006 1           EXTEND                  COUNTER DISABLED.
0042   REP  37  LAST  983   07,2537  03 012 1           WAND    CHAN12

0043   REP  3   LAST  140   07,2540  0 3070 0           TC      NOATTOFF        TURN OFF NO ATT LAMP.

0044   REP  40  LAST 1363   07,2541  3 4706 1           CAF     BIT5
0045                        07,2542  0 0006 1           EXTEND
0046   REP  38  LAST 1389   07,2543  05 012 1           WOR     CHAN12

00461  REP  3   LAST  140   07,2544  0 5410 1           TC      ZEROICDU
0047   REP  45  LAST 1363   07,2545  3 4705 1           CAF     BIT6            WAIT 320 MS TO GIVE AGS ADEQUATE TIME TO
0048   REP  53  LAST 1387   07,2546  0 5140 1           TC      WAITLIST        RECEIVE ITS PULSE TRAIN.
0049   REP  5   LAST  183   E3,1474                     EBANK=  CDUIND
0050   REP  1               07,2547   02561 1           2CADR   IMUZERO2
0050   REP  1               07,2550   16103 1

0051   REP  45  LAST 1389   07,2551  4 1320 0           CS      IMODES30        SEE IF IMU OPERATING AND ALARM IF NOT.
0052   REP  34  LAST 1388   07,2552  7 4702 1           MASK    BIT9
0053   REP  372 LAST 1389   07,2553  10 000 0           CCS     A
0054   REP  1               07,2554  1 2557 0           TCF     MODEXIT
```

L IMU MODE SWITCHING ROUTINES


```
0055  REF  38  LAST 1389   07,2555  0 5537 0            TC      ALARM
0056                       07,2556   00210 1            OCT     210

0057                       07,2557  0 0003 1  MODEEXIT  RELINT
0058  REF   7  LAST 1383   07,2560  1 4570 0            TCF     SWRETURN
0059  REF   1              07,2561  0 3443 1  IMUZERO2  TC      CAGETEST
0061  REF   4  LAST 1389   07,2562  0 5410 1            TC      ZEROICDU

0062  REF  41  LAST 1389   07,2563  4 4706 0            CS      BIT5
0063                       07,2564  0 0006 1            EXTEND
0064  REF  39  LAST 1389   07,2565  03 012 1            WAND    CHAN12

0065  REF  36  LAST 1363   07,2566  3 4700 1            CAF     BIT11
0066  REF   4  LAST  159   07,2567  0 5161 1            TC      VARDELAY

0067  REF   2  LAST 1390   07,2570  0 3443 1  IMUZERO3  TC      CAGETEST
0069  REF   2  LAST 1389   07,2571  4 5656 0            CS      BITS3,4
0070  REF  46  LAST 1389   07,2572  7 1320 0            MASK    IMODES30
0071  REF  47  LAST 1390   07,2573  55=320 0            TS      IMODES30

0072  REF   3  LAST 1389   07,2574  4 4730 0            CS      SUPER011
0073  REF  31  LAST 1389   07,2575  7 1321 1            MASK    IMODES33
0074  REF  32  LAST 1390   07,2576  55=321 1            TS      IMODES33

0075  REF  39  LAST 1060   07,2577  0 4633 0            TC      IBNKCALL
0076  REF   5  LAST  154   07,2600   14665 1            CADR    SETISSW

0077  REF   1              07,2601  1 3433 1            TCF     ENDIMU
```

GENERAL MODE-SWITCHING EXIT.

ZERO CDUX, CDUY, CDUZ

REMOVE ZERO DISCRETE.

WAIT 10 SECS FOR CTRS TO FIND GIMBALS

REMOVE IMUFAIL AND ICDUFAIL INHIBIT.

ENABLE DAP AUTO AND HOLD MODES
BIT5 FOR GROUND

SET ISS WARNING IF EITHER OF ABOVE ARE PRESENT.

```
P0078           IMU COARSE ALIGN MODE.

0079                          07,2602  0 0004 0  IMUCOARS INHINT
0080   REF   3  LAST 1389    07,2603  0 3455 0           TC     CAGETSTJ
0081   REF   3  LAST  183    07,2604  0 2746 0           TC     SETCOARS

0082   REF  41  LAST 1384    07,2605  3 6211 0           CAF    SIX
0083   REF  54  LAST 1389    07,2606  0 5140 1           TC     WAITLIST
0084   REF   6  LAST 1389    E3,1474                    EBANK= CDUIND
0085   REF   1               07,2607   02612 0          2CADR  COARS
0085   REF   1               07,2610   16103 1

0086   REF   2  LAST 1389    07,2611  1 2557 0           TCF    MODEEXIT

0087   REF   3  LAST 1390    07,2612  0 3443 1  COARS    TC     CAGETEST
0088   REF  46  LAST 1389    07,2613  3 4705 1           CAF    BIT8          ENABLE ALL THREE ISS CDU ERROR COUNTERS
0089                          07,2614  0 0006 1           EXTEND
0090   REF  40  LAST 1390    07,2615  05 012 1           WOR    CHAN12

0091   REF  69  LAST 1379    07,2616  3 4711 1           CAF    TWO           SET CDU INDICATOR
0092   REF   7  LAST 1391    07,2617  55=474 0  COARS1   TS     CDUIND

0093   REF   8  LAST 1391    07,2620  51=474 1           INDEX  CDUIND        COMPUTE THETAD - THETAA IN 1'S
0094   REF  21  LAST 1328    07,2621  3 1155 1           CA     THETAD          COMPLEMENT FORM
0095                          07,2622  0 0006 1           EXTEND
0096   REF   9  LAST 1391    07,2623  5 1474 1           INDEX  CDUIND
0097   REF  30  LAST 1388    07,2624  20 032 1           MSU    CDUX
0098                          07,2625  0 0006 1           EXTEND
0099   REF  45  LAST 1363    07,2626  7 4676 0           MP     BIT13         SHIFT RIGHT 2
0100   REF 223  LAST 1384    07,2627  56 001 0           XCH    L             ROUND
0101                          07,2630  6 0000 1           DOUBLE
0102   REF  14  LAST 1379    07,2631  54 061 1           TS     ITEMP1
0103                          07,2632  1 2634 0           TCF    +2
0104   REF 224  LAST 1391    07,2633  26 001 1           ADS    L

0105   REF  10  LAST 1391    07,2634  51=474 1           INDEX  CDUIND        DIFFERENCE TO BE COMPUTED
0106   REF   2  LAST 1388    07,2635  23=471 1           LXCH   COMMAND
0107   REF  11  LAST 1391    07,2636  11=474 0           CCS    CDUIND
0108   REF   1               07,2637  0 2617 0           TC     COARS1

0109   REF  70  LAST 1391    07,2640  3 4711 1           CAF    TWO           MINIMUM OF 4 MS WAIT
0110   REF   5  LAST 1390    07,2641  0 5161 1           TC     VARDELAY
```

L IMU MODE SWITCHING ROUTINES

```
0111  REF   4  LAST 1391   07,2642  0 3443 1  COARS2   TC     CAGETEST    DONT CONTINUE IF CAGED.
0112  REF  15  LAST 1391   07,2643  54 061 1            TS     ITEMP1      SETS TO +0.
0113  REF  71  LAST 1391   07,2644  3 4711 1            CAP    TWO         SET CDU INDICATOR
0114  REF  12  LAST 1391   07,2645  55=474 0   +3       TS     CDUIND

0115  REF  13  LAST 1392   07,2646  51=474 1            INDEX  CDUIND
0116  REF   3  LAST 1391   07,2647  11=471 0            CCS    COMMAND     NUMBER OF PULSES REQUIRED
0117  REF   1               07,2650  0 2654 1            TC     COMPOS      GREATER THAN MAX ALLOWED
0118  REF   1               07,2651  0 2663 0            TC     NEXTCDU +1
0119  REF   1               07,2652  0 2721 1            TC     COMNEG
0120  REF   2  LAST 1392   07,2653  0 2663 0            TC     NEXTCDU +1

0121  REF   1               07,2654  6 3544 1  COMPOS    AD     -COMMAX     COMMAX = MAX NUMBER OF PULSES ALLOWED
0122                        07,2655  0 0006 1            EXTEND               MINUS ONE
0123  REF   1               07,2656  6 2731 0            BZMF   COMZERO
0124  REF  14  LAST 1392   07,2657  51=474 1            INDEX  CDUIND
0125  REF   4  LAST 1392   07,2660  55=471 0            TS     COMMAND     REDUCE COMMAND BY MAX NUMBER OF PULSES
0126  REF   1               07,2661  4 3545 1            CS     -COMMAX-     ALLOWED

0127  REF  16  LAST 1392   07,2662  24 061 0  NEXTCDU   INCR   ITEMP1
0128  REF  16  LAST 1364   07,2663  6 4713 0            AD     NEG0
0129  REF  15  LAST 1392   07,2664  51=474 1            INDEX  CDUIND
0130  REF   4  LAST  983   07,2665  54 050 0            TS     CDUXCMD     SET UP COMMAND REGISTER.

0131  REF  16  LAST 1392   07,2666  11=474 0            CCS    CDUIND
0132  REF   1               07,2667  0 2645 1            TC     COARS2 +3

0133  REF  17  LAST 1392   07,2670  10 061 1            CCS    ITEMP1      SEE IF ANY PULSES TO GO OUT.
0134  REF   1               07,2671  1 2735 0            TCF    SENDPULS

0135  REF  13  LAST  781   07,2672  0 5156 0            TC     FIXDELAY    WAIT FOR GIMBALS TO SETTLE.
0136                        07,2673   00226 1            DEC    150
0137  REF  72  LAST 1392   07,2674  3 4711 1            CAP    TWO
0138  REF  18  LAST 1392   07,2675  54 061 1  CHKCORS   TS     ITEMP1      AT END OF COMMAND, CHECK TO SEE THAT
0139  REF 373  LAST 1389   07,2676  50 000 1            INDEX  A           GIMBALS ARE WITHIN 2 DEGREES OF THETAD.
0140  REF  31  LAST 1391   07,2677  3 0032 0            CA     CDUX
0141                        07,2700  0 0006 1            EXTEND
0142  REF  19  LAST 1392   07,2701  5 0061 0            INDEX  ITEMP1
0143  REF  22  LAST 1391   07,2702  21=155 0            MSU    THETAD
0144  REF 374  LAST 1392   07,2703  10 000 0            CCS    A
0145  REF   1               07,2704  1 2712 0            TCF    COARSERR
0146  REF   1               07,2705  1 2707 1            TCF    CORSCHK2
0147  REF   2  LAST 1392   07,2706  1 2712 0            TCF    COARSERR
```

L IMU MODE SWITCHING ROUTINES

```
0148  REP  20  LAST 1392   07,2707  10 061 1  CORSCHK2  CCS    ITEMP1
0149  REP   1              07,2710  1 2675 0           TCF    CHKCORS
0150  REP   2  LAST 1390   07,2711  1 3433 1           TCF    ENDIMU      END OF COARSE ALIGNMENT.

0151  REP   1              07,2712  6 2720 0  COARSERR AD     COARSTOL    2 DEGREES.
0152                       07,2713  0 0006 1           EXTEND
0153  REP   2  LAST 1392   07,2714  6 2707 0           BZMF   CORSCHK2

0154  REP  39  LAST 1390   07,2715  0 5537 0           TC     ALARM       COARSE ALIGN ERROR.
0155                       07,2716   00211 0           OCT    211

0156  REP   2  LAST  139   07,2717  1 3441 1           TCF    IMUBAD

0157                       07,2720   77511 1  COARSTOL DEC    -.01111     2 DEGREES SCALED AT HALF-REVOLUTIONS
0158  REP   2  LAST 1392   07,2721  6 3544 1  COMNEG   AD     -COMMAX
0159                       07,2722  0 0006 1           EXTEND
0160  REP   2  LAST 1392   07,2723  6 2731 0           BZMF   COMZERO
0161                       07,2724  4 0000 0           COM
0162  REP  17  LAST 1392   07,2725  51=474 1           INDEX  CDUIND
0163  REP   5  LAST 1392   07,2726  55=471 0           TS     COMMAND
0164  REP   2  LAST 1392   07,2727  3 3545 0           CA     -COMMAX-
0165  REP   3  LAST 1392   07,2730  0 2682 1           TC     NEXTCDU

0166  REP 255  LAST 1388   07,2731  3 4714 1  COMZERO  CAF    ZERO
0167  REP  18  LAST 1393   07,2732  51=474 1           INDEX  CDUIND
0168  REP   6  LAST 1393   07,2733  57=471 1           XCH    COMMAND
0169  REP   4  LAST 1393   07,2734  0 2682 1           TC     NEXTCDU
0170  REP   6  LAST 1037   07,2735  3 7707 0  SENDPULS CAF    13,14,15
0171                       07,2736  0 0006 1           EXTEND
0172  REP  12  LAST  983   07,2737  05 014 1           WOR    CHAN14
0173  REP   1              07,2740  3 3546 0           CAF    600MS
0174  REP   2  LAST 1392   07,2741  1 2641 1           TCF    COARS2 -1   THEN TO VARDELAY
0175  REP  47  LAST 1391   07,2742  3 4705 1  CA+ECE   CAF    BIT6        ENABLE ALL THREE ISS CDU ERROR COUNTERS
0176                       07,2743  0 0006 1           EXTEND
0177  REP  41  LAST 1391   07,2744  05 012 1           WOR    CHAN12
0178  REP  65  LAST 1283   07,2745  0 5213 1           TC     TASKOVER
```

```
0179  REF  41  LAST 1363   07,2746  3 4707 0  SETCOARS CAF    BIT4          BYPASS IF ALREADY IN COARSE ALIGN
0180                       07,2747  0 0006 1           EXTEND
0181  REF  42  LAST 1393   07,2750  02 012 0           RAND   CHAN12
0182  REF 375  LAST 1392   07,2751  10 000 0           CCS    A
0183  REF 320  LAST 1388   07,2752  0 0002 0           TC     Q

0184  REF  48  LAST 1393   07,2753  4 4705 0           CS     BIT6          CLEAR ISS ERROR COUNTERS
0185                       07,2754  0 0006 1           EXTEND
0186  REF  43  LAST 1394   07,2755  03 012 1           WAND   CHAN12

0187  REF  39  LAST 1385   07,2756  4 4701 1           CS     BIT10         KNOCK DOWN GYRO ACTIVITY
0188                       07,2757  0 0006 1           EXTEND
0189  REF  13  LAST 1393   07,2760  03 014 1           WAND   CHAN14
0190  REF 256  LAST 1393   07,2761  4 4714 0           CS     ZERO
0191  REF   2  LAST  148   07,2762  54 047 0           TS     GYROCMD

0192  REF  42  LAST 1394   07,2763  3 4707 0           CAF    BIT4          PUT ISS IN COARSE ALIGN
0193                       07,2764  0 0006 1           EXTEND
0194  REF  44  LAST 1394   07,2765  05 012 1           WOR    CHAN12

0195  REF  42  LAST 1389   07,2766  4 1036 1           CS     DSPTAB +11D   TURN ON NO ATT LAMP
0196  REF   1               07,2767  7 3011 0           MASK   OCT40010
0197  REF  43  LAST 1394   07,2770  27=036 1           ADS    DSPTAB +11D

0198  REF  33  LAST 1390   07,2771  4 1321 1           CS     IMODES33      DISABLE DAP AUTO AND HOLD MODES
0199  REF  49  LAST 1394   07,2772  7 4705 0           MASK   BIT6
0200  REF  34  LAST 1394   07,2773  27=321 1           ADS    IMODES33

0201  REF  48  LAST 1390   07,2774  4 1320 0           CS     IMODES30      DISABLE IMUFAIL
0202  REF  43  LAST 1394   07,2775  7 4707 1           MASK   BIT4
0203  REF  49  LAST 1394   07,2776  27=320 0           ADS    IMODES30

0204  REF  42  LAST 1390   07,2777  4 4706 0  RNDREFDR CS     BIT5          KNOCK DOWN TRACK FLAG
0205  REF  24  LAST  989   07,3000  7 0075 1           MASK   FLAGWRD1
0206  REF  25  LAST 1394   07,3001  54 075 1           TS     FLAGWRD1

0207  REF  51  LAST 1377   07,3002  4 4674 1           CS     BIT15         KNOCK DOWN DRIFT FLAG
0208  REF  19  LAST 1195   07,3003  7 0076 1           MASK   FLAGWRD2
0209  REF  20  LAST 1394   07,3004  54 076 1           TS     FLAGWRD2

0210  REF  46  LAST 1391   07,3005  4 4676 0           CS     BIT13         KNOCK DOWN REFSMMAT FLAG
0211  REF   2  LAST  417   07,3006  7 0077 0           MASK   FLAGWRD3
0212  REF   3  LAST 1394   07,3007  54 077 0           TS     FLAGWRD3

0213  REF 321  LAST 1394   07,3010  0 0002 0           TC     Q

0214                       07,3011   40010 1  OCT40010 OCT    40010
```

P0215 IMU FINE ALIGN MODE SWITCH.

```
0216                          07,3012  0 0004 0  IMUFINE  INHINT
0217  REF   4  LAST 1391     07,3013  0 3455 0            TC      CAGETSTJ     SEE IF IMU BEING CAGED.

0218  REF   1                07,3014  4 3543 1            CS      BITS4-5      RESET ZERO AND COARSE
0219                          07,3015  0 0006 1            EXTEND
0220  REF  45  LAST 1394     07,3016  03 012 1            WAND    CHAN12

0221  REF  50  LAST 1394     07,3017  4 4705 0            CS      BIT6         INSURE DAP AUTO AND HOLD MODES ENABLED
0222  REF  35  LAST 1394     07,3020  7 1321 1            MASK    IMODES33
0223  REF  36  LAST 1395     07,3021  55=321 1            TS      IMODES33

0224  REF   4  LAST 1389     07,3022  0 3070 0            TC      NOATTOFF

0225  REF  40  LAST 1394     07,3023  3 4701 0            CAF     BIT10        IMU FAIL WAS INHIBITED DURING THE
0226  REF  55  LAST 1391     07,3024  0 5140 1            TC      WAITLIST     PRESUMABLY PRECEDING COARSE ALIGN. LEAVE
0227  REF  19  LAST 1393     E3,1474                     EBANK=  CDUIND
0228  REF   1                07,3025   03036 1           2CADR   IPAILOK      IT ON FOR THE FIRST 5 SECS OF FINE ALIGN
0228  REF   1                07,3026   16103 1

0229  REF   5  LAST  779     07,3027  3 4735 1            CAF     2SECS
0230  REF  56  LAST 1395     07,3030  0 5140 1            TC      WAITLIST
0231  REF  20  LAST 1395     E3,1474                     EBANK=  CDUIND
0232  REF   1                07,3031   03034 0           2CADR   IMUFINED
0232  REF   1                07,3032   16103 1

0233  REF   3  LAST 1391     07,3033  1 2557 0            TCF     MODEEXIT

0234  REF   5  LAST 1392     07,3034  0 3443 1  IMUFINED  TC      CAGETEST     SEE THAT NO ONE HAS CAGED THE IMU.
0235  REF   3  LAST 1393     07,3035  1 3433 1            TCF     ENDIMU
```

L IMU MODE SWITCHING ROUTINES


```
0236  REP   1                 07,3036  0 3450 0  IPAILOK  TC     CAGETSTQ     ENABLE IMU FIAL UNLESS IMU BEING CAGED.
0237  REP  66  LAST 1393      07,3037  1 5213 0           TCP    TASKOVER     IT IS.

0238  REP  44  LAST 1394      07,3040  3 4707 0           CAF    BIT4         DONT RESET IMU FAIL INHIBIT IF SOMEONE
0239                          07,3041  0 0006 1           EXTEND              HAS GONE INTO COARSE ALIGN.
0240  REP  46  LAST 1395      07,3042  02 012 0           RAND   CHAN12
0241  REP 376  LAST 1394      07,3043  10 000 0           CCS    A
0242  REP  67  LAST 1396      07,3044  1 5213 0           TCP    TASKOVER

0243  REP  50  LAST 1394      07,3045  4 1320 0           CS     IMODES30     RESET IMUFAIL.
0244  REP  47  LAST 1394      07,3046  7 4676 0           MASK   BIT13
0245  REP  51  LAST 1396      07,3047  27=320 0           ADS    IMODES30
0246  REP  45  LAST 1396      07,3050  4 4707 1           CS     BIT4
0247  REP  52  LAST 1396      07,3051  7 1320 0  PPAILOK2 MASK   IMODES30
0248  REP  53  LAST 1396      07,3052  55=320 0           TS     IMODES30
0249  REP  40  LAST 1390      07,3053  0 4633 0           TC     IBNKCALL     THE ISS WARNING LIGHT MAY COME ON NOW
0250  REP   6  LAST 1390      07,3054   14665 1           CADR   SETISSW      THAT THE INHIBIT HAS BEEN REMOVED.
0251  REP  68  LAST 1396      07,3055  1 5213 0           TCP    TASKOVER

0252  REP   2  LAST 1396      07,3056  0 3450 0  PPAILOK  TC     CAGETSTQ     ENABLE PIP FAIL PROG ALARM.
0253  REP  69  LAST 1396      07,3057  1 5213 0           TCP    TASKOVER

0254  REP  54  LAST 1396      07,3060  4 1320 0           CS     IMODES30     RESET IMU AND PIPA FAIL BITS.
0255  REP  41  LAST 1395      07,3061  7 4701 1           MASK   BIT10
0256  REP  55  LAST 1396      07,3062  27=320 0           ADS    IMODES30

0257  REP  37  LAST 1395      07,3063  4 1321 1           CS     IMODES33
0258  REP  48  LAST 1396      07,3064  7 4676 0           MASK   BIT13
0259  REP  38  LAST 1396      07,3065  27=321 1           ADS    IMODES33

0260  REP  43  LAST 1394      07,3066  4 4706 0           CS     BIT5
0261  REP   1                 07,3067  1 3051 1           TCP    PPAILOK2

0262  REP   2  LAST 1394      07,3070  4 3011 0  NOATTOFF CS     OCT40010     SUBROUTINE TO TURN OFF NO ATT LAMP.
0263  REP  44  LAST 1394      07,3071  7 1036 1           MASK   DSPTAB +11D
0264  REP  52  LAST 1394      07,3072  6 4674 0           AD     BIT15
0265  REP  45  LAST 1396      07,3073  55=036 1           TS     DSPTAB +11D
0266  REP 322  LAST 1394      07,3074  0 0002 0           TC     Q
```

```
P0287           ROUTINES TO INITIATE AND TERMINATE PROGRAM USE OF THE PIPAS. NO IMUSTALL REQUIRED IN EITHER CASE.

0272  REF 257  LAST 1394   07,3075  4 4714 0  PIPUSE   CS     ZERO
0273  REF  12  LAST  788   07,3076 54 037 1            TS     PIPAX
0274  REF   3  LAST  430   07,3077 54 040 1            TS     PIPAY
0275  REF   6  LAST  788   07,3100 54 041 0            TS     PIPAZ

02752 REF   3  LAST 1396   07,3101  0 3450 0  PIPUSE1  TC     CAGETSTQ      DO NOT ENABLE PIPA FAIL IF IMU IS CAGED
02754 REF   8  LAST 1390   07,3102  1 4570 0            TCF    SWRETURN

02756                      07,3103  0 0004 0            INHINT
0276  REF  78  LAST 1363   07,3104  4 4712 0            CS     BIT1          IF PIPA FAILS FROM NOW ON (UNTIL
0277  REF  56  LAST 1396   07,3105  4 1320 0            MASK   IMODES30      PIPFREE), LIGHT ISS WARNING.
0278  REF  57  LAST 1397   07,3106 55=320 0            TS     IMODES30

0279  REF  41  LAST 1396   07,3107  0 4633 0  PIPFREE2  TC     IBNKCALL      ISS WARNING MIGHT COME ON NOW.
0280  REF   7  LAST 1396   07,3110   14665 1            CADR   SETISSW       (OR GO OFF ON PIPFREE).

0281  REF   4  LAST 1395   07,3111  1 2557 0            TCF    MODEEXIT

0282                       07,3112  0 0004 0  PIPFREE   INHINT               PROGRAM DONE WITH PIPAS. DONT LIGHT
0283  REF  58  LAST 1397   07,3113  4 1320 0            CS     IMODES30      ISS WARNING.
0284  REF  79  LAST 1397   07,3114  7 4712 0            MASK   BIT1
0285  REF  59  LAST 1397   07,3115 27=320 0            ADS    IMODES30

0286  REF  42  LAST 1396   07,3116  7 4701 1            MASK   BIT10         IF PIP FAIL ON, DO PROG ALSRM AND RESET
0287  REF 377  LAST 1396   07,3117 10 000 0            CCS    A              ISS WARNING.
0288  REF   5  LAST 1397   07,3120  1 2557 0            TCF    MODEEXIT

0289  REF  40  LAST 1393   07,3121  0 5537 0            TC     ALARM
0290                       07,3122   00212 0            OCT    212

0291                       07,3123  0 0004 0            INHINT

0292  REF   1              07,3124  1 3107 0            TCF    PIPFREE2
```

P0293 THE FOLLOWING ROUTINE TORQUES THE IRIGS ACCORDING TO DOUBLE PRECISION INPUTS IN THE SIX REGISTERS
R0295 BEGINNING AT THE ECADR ARRIVING IN A. THE MINIMUM SIZE OF ANY PULSE TRAIN IS 16 PULSES (.25 CDU COUNTS). THE
R0297 UNSENT PORTION OF THE COMMAND IS LEFT INTACT IN THE INPUT COMMAND REGISTERS.

```
0299                          E3,1400                          EBANK= 1400          VARIABLE, ACTUALLY.

0300  REF 673  LAST 1387   07,3125  54 161 0  IMUPULSE TS     MPAC +5      SAVE ARRIVING ECADR.
0301  REF   5  LAST 1395   07,3126  0 3455 0            TC     CAGETSTJ     DONT PROCEED IF IMU BEING CAGED.

0302  REF   3  LAST  437   07,3127  11"304 0            CCS    LGYRO        SEE IF GYROS BUSY.
0303  REF   1               07,3130  0 3171 0            TC     GYROBUSY     SLEEP.

0304  REF 674  LAST 1398   07,3131  54 156 1            TS     MPAC +2
0305  REF  51  LAST 1395   07,3132  3 4705 1            CAF    BIT8         ENABLE THE POWER SUPPLY.
0306                        07,3133  0 0006 1            EXTEND
0307  REF  14  LAST 1394   07,3134  05 014 1            WOR    CHAN14

0308  REF  20  LAST 1363   07,3135  3 4710 0            CAF    FOUR
0310  REF  57  LAST 1395   07,3136  0 5140 1  GWAKE2     TC     WAITLIST     (IF A JOB WAS PUT TO SLEEP, THE POWER
0311  REF  21  LAST 1395   E3,1474                      EBANK= CDUIND       SUPPLY IS LEFT ON BY THE WAKING JOB).
0312  REF   1               07,3137   03207 1           2CADR  STRTGYRO
0312  REF   1               07,3140   16103 1

0313  REF 675  LAST 1398   07,3141  3 0161 1            CA     MPAC +5      SET UP EBANK, SAVING CALLER'S EBANK FOR
0314  REF  58  LAST 1367   07,3142  56 003 1            XCH    EBANK        RESTORATION ON RETURN.
0315  REF 676  LAST 1398   07,3143  56 161 1            XCH    MPAC +5
0316  REF   4  LAST 1398   07,3144  55"304 0            TS     LGYRO        RESERVES GYROS.
0317  REF  14  LAST 1364   07,3145  7 4373 0            MASK   LOW8
0318  REF  21  LAST 1393   07,3146  54 061 1            TS     ITEMP1

0319  REF  73  LAST 1392   07,3147  3 4711 1            CAF    TWO          FORCE SIGN AGREEMENT ON INPUTS.
0320  REF 677  LAST 1398   07,3150  54 157 0  GYROAGRE  TS     MPAC +3
0321                        07,3151  6 0000 1            DOUBLE
0322  REF  22  LAST 1398   07,3152  6 0061 0            AD     ITEMP1
0323  REF 678  LAST 1398   07,3153  54 160 1            TS     MPAC +4
0324                        07,3154  0 0006 1            EXTEND
0325  REF 378  LAST 1397   07,3155  5 0000 1            INDEX  A
0326                        07,3156  3 1401 0            DCA    1400
0327  REF 679  LAST 1398   07,3157  52 155 1            DXCH   MPAC
0328  REF  11  LAST 1299   07,3160  0 7226 0            TC     TPAGREE
0329  REF 680  LAST 1398   07,3161  52 155 1            DXCH   MPAC
0330  REF 681  LAST 1398   07,3162  50 160 0            INDEX  MPAC +4
0331                        07,3163  53"401 1            DXCH   1400

0332  REF 682  LAST 1398   07,3164  10 157 0            CCS    MPAC +3
0333  REF   1               07,3165  1 3150 1            TCF    GYROAGRE

0334  REF 683  LAST 1398   07,3166  3 0161 1            CA     MPAC +5      RESTORE CALLER'S EBANK.
0335  REF  59  LAST 1398   07,3167  54 003 0            TS     EBANK
0336  REF   6  LAST 1397   07,3170  1 2557 0            TCF    MODEEXIT
```

L IMU MODE SWITCHING ROUTINES

P0337 ROUTINES TO ALLOW TORQUING BY ONLY ONE JOB AT A TIME.

```
0338                          07,3171  0 0006 1  GYROBUSY EXTEND              SAVE RETURN 2PCADR.
0339  REP  20  LAST 1160     07,3172  3 0134 1            DCA     BUF2
0340  REP 684  LAST 1398     07,3173  52 155 1            DXCH    MPAC
0341  REP   1                07,3174  3 3206 0  REQSLEEP CAF     LGWAKE
0342  REP   5  LAST 1294     07,3175  1 5070 1            TCF     JOBSLEEP

0343  REP   5  LAST 1398     07,3176  11=304 0  GWAKE    CCS     LGYRO       WHEN AWAKENED, SEE IF GYROS STILL BUSY.
0344  REP   1                07,3177  1 3174 1          TCF     REQSLEEP    IF SO, SLEEP SOME MORE.

0345  REP 685  LAST 1399     07,3200  54 156 1          TS      MPAC +2
0346                          07,3201  0 0006 1          EXTEND
0347  REP 686  LAST 1399     07,3202  3 0155 0          DCA     MPAC
0348  REP  21  LAST 1399     07,3203  52 134 0          DXCH    BUF2        RESTORE SWRETURN INFO.
0349  REP 160  LAST 1384     07,3204  3 4712 1          CAF     ONE
0350  REP   1                07,3205  1 3136 1          TCF     GWAKE2

0351  REP   1                07,3206   17176 1  LGWAKE   CADR    GWAKE
```

P0352 GYRO-TORQUING WAITLIST TASKS.

```
0353  REF   1              07,3207  4 3430 1  STRTGYRO CS      GDESELCT      DE-SELECT LAST GYRO.
0354                       07,3210  0 0006 1           EXTEND
0355  REF  15  LAST 1398  07,3211  03 014 1           WAND     CHAN14

0356  REF   6  LAST 1395  07,3212  0 3443 1           TC       CAGETEST

0357  REF   6  LAST 1399  07,3213  3 1304 1  STRTGYR2 CA       LGYRO         JUMP ON PHASE COUNTER IN BITS 13-14.
0358                       07,3214  0 0006 1           EXTEND
0359  REF  46  LAST 1396  07,3215  7 4707 1           MP       BIT4
0360  REF 379  LAST 1398  07,3216  50 000 1           INDEX    A
0361                       07,3217  1 3220 0           TCF      +1
0362  REF   1              07,3220  0 3235 0           TC       GSELECT       =0. DO Y GYRO.
0363                       07,3221   00202 1           OCT      00202

0364  REF   2  LAST 1400  07,3222  0 3235 0           TC       GSELECT       =1. DO Z GYRO.
0365                       07,3223   00302 0           OCT      00302

0366  REF   3  LAST 1400  07,3224  0 3233 0           TC       GSELECT -2    =2. DO X GYRO.
0367                       07,3225   00100 0           OCT      00100

0368  REF 258  LAST 1397  07,3226  3 4714 1           CAF      ZERO          =3. DONE
0369  REF   7  LAST 1400  07,3227  55#304 0           TS       LGYRO
0370  REF   2  LAST 1399  07,3230  3 3206 0           CAF      LGWAKE        WAKE A POSSIBLE SLEEPING JOB.
0371  REF   6  LAST 1294  07,3231  0 5074 1           TC       JOBWAKE

0372  REF   2  LAST 1395  07,3232  1 3034 1  NORESET  TCF      IMUFINED      DO NOT RESET POWER SUPPLY
```

```
0373  REF  21  LAST 1398   07,3233  4 4710 1   -2       CS    FOUR      SPECIAL ENTRY TO REGRESS LGYRO FOR X.
0374  REF   8  LAST 1400   07,3234  27=304 0             ADS   LGYRO

0375  REF 323  LAST 1396   07,3235  50 002 0   GSELECT   INDEX Q         SELECT GYRO.
0376                       07,3236  3 0000 1             CAF   0         PACKED WORD CONTAINS GYRO SELECT BITS
0377  REF   4  LAST 1379   07,3237  54 064 1             TS    ITEMP4    AND INCREMENT TO LGYRO.
0378  REF  20  LAST 1371   07,3240  7 4716 1             MASK  SEVEN
0379  REF  49  LAST 1396   07,3241  6 4676 1             AD    BIT13
0380  REF   9  LAST 1401   07,3242  27=304 0             ADS   LGYRO
0381  REF  60  LAST 1398   07,3243  54 003 0             TS    EBANK
0382  REF  15  LAST 1398   07,3244  7 4373 0             MASK  LOW8
0383  REF  23  LAST 1398   07,3245  54 061 1             TS    ITEMP1

0384  REF  21  LAST 1401   07,3246  4 4716 1             CS    SEVEN
0385  REF   5  LAST 1401   07,3247  7 0064 1             MASK  ITEMP4
0386  REF   6  LAST 1401   07,3250  54 064 1             TS    ITEMP4

0387                       07,3251  0 0006 1             EXTEND              MOVE DP COMMAND TO RUPTREGS FOR TESTING.
0388  REF  24  LAST 1401   07,3252  5 0061 0             INDEX ITEMP1
0389                       07,3253  3 1401 0             DCA   1400
0390  REF  28  LAST 1379   07,3254  52 071 0             DXCH  RUPTREG1

0391  REF  29  LAST 1401   07,3255  10 070 1             CCS   RUPTREG1
0392  REF   1               07,3256  1 3271 1             TCF   MAJ+
0393                       07,3257  1 3281 0             TCF   +2
0394  REF   1               07,3260  1 3411 1             TCF   MAJ-

0395  REF   7  LAST 1379   07,3261  10 071 0             CCS   RUPTREG2
0396  REF   1               07,3262  1 3266 1             TCF   MIN+
0397  REF   1               07,3263  1 3213 0             TCF   STRTGYR2
0398  REF   1               07,3264  1 3406 1             TCF   MIN-
0399  REF   2  LAST 1401   07,3265  1 3213 0             TCF   STRTGYR2
```

```
0400  REP   1                07,3266  6 3322 1  MIN+     AD      -GYROMIN     SMALL POSITIVE COMMAND. SEE IF AT LEAST
0401                         07,3267  0 0006 1           EXTEND               16 GYRO PULSES.
0402  REP   3  LAST 1401      07,3270  6 3213 1           BZMF    STRTGYR2

0403                         07,3271  0 0006 1  MAJ+     EXTEND               DEFINITE POSITIVE OUTPUT.
0404  REP   1                07,3272  3 3432 1           DCA     GYROFRAC
0405  REP   30 LAST 1401      07,3273  20 071 0           DAS     RUPTREG1

0406  REP   7  LAST 1401      07,3274  3 0064 0           CA      ITEMP4       SELECT POSITIVE TORQUING FOR THIS GYRO.
0407                         07,3275  0 0006 1           EXTEND
0408  REP   16 LAST 1400      07,3276  05 014 1           WOR     CHAN14

0409  REP   10 LAST 1387      07,3277  3 6043 0           CAF     LOW7         LEAVE NUMBER OF POSSIBLE 8192 AUGMENTS
0410  REP   8  LAST 1401      07,3300  7 0071 0           MASK    RUPTREG2     TO INITIAL COMMAND IN MAJOR PART OF LONG
0411  REP   9  LAST 1402      07,3301  56 071 1           XCH     RUPTREG2     TERM STORAGE AND TRUNCATED FRACTION
0412                         07,3302  0 0006 1  GMERGE   EXTEND               IN MINOR PART. THE MAJOR PART WILL BE
0413  REP   30 LAST 1378      07,3303  7 4703 0           MP      BIT8         COUNTED DOWN TO ZERO IN THE COURSE OF
0414  REP   17 LAST 1379      07,3304  54 062 1           TS      ITEMP2       PUTTING OUT THE ENTIRE COMMAND.
0415  REP   31 LAST 1402      07,3305  3 0070 0           CA      RUPTREG1
0416                         07,3306  0 0006 1           EXTEND
0417  REP   35 LAST 1389      07,3307  7 4702 1           MP      BIT9
0418  REP   32 LAST 1402      07,3310  54 070 1           TS      RUPTREG1
0419  REP 225  LAST 1391      07,3311  3 0001 0           CA      L
0420                         07,3312  0 0006 1           EXTEND
0421  REP   76 LAST 1363      07,3313  7 4675 0           MP      BIT14
0422  REP   18 LAST 1402      07,3314  26 062 1           ADS     ITEMP2       INITIAL COMMAND.

0423                         07,3315  0 0006 1           EXTEND               SEE IF MORE THAN ONE PULSE TRAIN NEEDED
0424  REP   33 LAST 1402      07,3316  3 0071 1           DCA     RUPTREG1     (MORE THAN 16383 PULSES).
0425  REP   1                07,3317  6 7716 0           AD      MINUS1
0426  REP 380  LAST 1400      07,3320  10 000 0           CCS     A
0427  REP   1                07,3321  1 3345 1           TCF     LONGGYRO
0428                         07,3322   77601 0  -GYROMIN CCT     -176         MAY BE ADJUSTED TO SPECIFY MINIMUM CMD
0429                         07,3323  1 3327 0           TCF     +4

0430  REP   77 LAST 1402      07,3324  3 4675 1           CAF     BIT14
0431  REP   19 LAST 1402      07,3325  26 062 1           ADS     ITEMP2
0432  REP 259  LAST 1400      07,3326  3 4714 1           CAF     ZERO

0433  REP   25 LAST 1401      07,3327  50 061 0  +4       INDEX   ITEMP1
0434                         07,3330  53=401 1           DXCH    1400
```

L IMU MODE SWITCHING ROUTINES

```
0435  REP 20  LAST 1402  07,3331  3 0062 0          CA     ITEMP2      ENTIRE COMMAND.
0436  REP  3  LAST 1394  07,3332  54 047 0 LASTSPG  TS     GYROCMD
0437                     07,3333  0 0006 1          EXTEND
0438  REP 43  LAST 1397  07,3334  7 4701 1          MP     BIT10       WAITLIST DT
0439  REP 47  LAST 1387  07,3335  6 6214 0          AD     THREE       TRUNCATION AND PHASE UNCERTAINTIES.
0440  REP 58  LAST 1398  07,3336  0 5140 1          TC     WAITLIST
0441  REP 22  LAST 1398  E3,1474                    EBANK= CDUIND
0442  REP  2  LAST 1398  07,3337   03207 1          2CADR  STRTGYRO
0442                     07,3340   16103 1

0448  REP 44  LAST 1403  07,3341  3 4701 0 GYROEXIT CAF    BIT10
0449                     07,3342  0 0006 1          EXTEND
0450  REP 17  LAST 1402  07,3343  05 014 1          WOR    CHAN14
0451  REP 70  LAST 1396  07,3344  1 5213 0          TCF    TASKOVER

0452  REP 26  LAST 1402  07,3345  50 061 0 LONGGYRO INDEX  ITEMP1      INITIAL COMMAND OUT PLUS N AUGMENTS OF
0453                     07,3346  53=401 1          DXCH   1400        8192. INITIAL COMMAND IS AT LEAST 8192.
0454  REP 78  LAST 1402  07,3347  3 4675 1          CAF    BIT14
0455  REP 21  LAST 1403  07,3350  6 0062 0          AD     ITEMP2
0456  REP  4  LAST 1403  07,3351  54 047 0          TS     GYROCMD

0457                     07,3352  0 0006 1 AUG3     EXTEND              GET WAITLIST DT TO TIME WHEN TRAIN IS
0458  REP 45  LAST 1403  07,3353  7 4701 1          MP     BIT10       ALMOST OUT.
0459  REP  4  LAST 1364  07,3354  6 7714 1          AD     NEG3
0460  REP 59  LAST 1403  07,3355  0 5140 1          TC     WAITLIST
0461  REP 23  LAST 1403  E3,1474                    EBANK= CDUIND
0462  REP  1             07,3356   03361 0          2CADR  8192AUG
0462  REP  1             07,3357   16103 1
0463  REP  1             07,3360  1 3341 0          TCF    GYROEXIT

0464  REP  7  LAST 1400  07,3361  0 3443 1 8192AUG  TC     CAGETEST

04641 REP 47  LAST 1400  07,3362  3 4707 0          CAF    BIT4
04642                    07,3363  0 0006 1          EXTEND
04643 REP 47  LAST 1396  07,3364  02 012 0          RAND   CHAN12
04644 REP 381 LAST 1402  07,3365  10 000 0          CCS    A
04645 REP  3  LAST 1393  07,3366  1 3441 1          TCF    IMUBAD
0465  REP 10  LAST 1401  07,3367  3 1304 1          CA     LGYRO       ADD 8192 PULSES TO GYROCMD
0466  REP 61  LAST 1401  07,3370  54 003 0          TS     EBANK
0467  REP 16  LAST 1401  07,3371  7 4373 0          MASK   LOW8
0468  REP 27  LAST 1403  07,3372  54 061 1          TS     ITEMP1

0469  REP 28  LAST 1403  07,3373  50 061 0          INDEX  ITEMP1      SEE IF THIS IS THE LAST AUG.
0470                     07,3374  11=400 0          CCS    1400
0471  REP  1             07,3375  1 3401 0          TCF    AUG2        MORE TO COME.

0472  REP 79  LAST 1403  07,3376  3 4675 1          CAF    BIT14
0473  REP  5  LAST 1403  07,3377  26 047 0          ADS    GYROCMD
0474  REP  1             07,3400  1 3333 0          TCF    LASTSPG +1
```

L IMU MODE SWITCHING ROUTINES


```
0475  REP  29  LAST 1403   07,3401  50 061 0  AUG2     INDEX  ITEMP1
0476                       07,3402  55=400 0           TS     1400
0477  REP  80  LAST 1403   07,3403  3 4675 1           CAF    BIT14
0478  REP   6  LAST 1403   07,3404  26 047 0           ADS    GYROCMD
0479  REP   1              07,3405  1 3352 1           TCF    AUG3      COMPUTE DT.
```

```
0480  REF   2  LAST 1402   07,3406  6 3322 1  MIN-    AD      -GYROMIN        POSSIBLE NEGATIVE OUTPUT.
0481                       07,3407  0 0006 1          EXTEND
0482  REF   4  LAST 1402   07,3410  6 3213 1          BZMP    STRTGYR2

0483                       07,3411  0 0006 1  MAJ-    EXTEND                  DEFINITE NEGATIVE OUTPUT.
0484  REF   2  LAST 1402   07,3412  4 3432 0          DCS     GYROFRAC
0485  REF  34  LAST 1402   07,3413  20 071 0          DAS     RUPTREG1

0486  REF   8  LAST 1402   07,3414  3 0064 0          CA      ITEMP4          SELECT NEGATIVE TORQUING FOR THIS GYRO.
0487  REF  36  LAST 1402   07,3415  6 4702 0          AD      BIT9
0488                       07,3416  0 0006 1          EXTEND
0489  REF  16  LAST 1403   07,3417  05 014 1          WOR     CHAN14

0490  REF  35  LAST 1405   07,3420  4 0070 1          CS      RUPTREG1        SET UP RUPTREGS TO FALL INTO GMERGE.
0491  REF  36  LAST 1405   07,3421  54 070 1          TS      RUPTREG1        ALL NUMBERS PUT INTO GYROCMD ARE
0492  REF  10  LAST 1402   07,3422  4 0071 0          CS      RUPTREG2        POSITIVE - BIT9 OF CHAN 14 DETERMINES
0493  REF  11  LAST 1402   07,3423  7 6043 1          MASK    LOW7            THE SIGN OF THE COMMAND.
0494                       07,3424  4 0000 0          COM
0495  REF  11  LAST 1405   07,3425  56 071 1          XCH     RUPTREG2
0496                       07,3426  4 0000 0          COM
0497  REF   1              07,3427  1 3302 1          TCF     GMERGE

0498                       07,3430   01700 1  GDESELCT OCT     1700            TURN OFF SELECT AND ACTIVITY BITS.

0499                       07,3431   00000 1  GYROFRAC 2DEC    .215 B -21
0499                       07,3432   00034 0
```

```
P0500           IMU MODE SWITCHING ROUTINES COME HERE WHEN ACTION COMPLETE.

0501                          07,3433  0 0006 1  ENDIMU   EXTEND                 MODE IS BAD IF CAGE HAS OCCURED OR IF
0502  REF   33  LAST 1190    07,3434  00 011 1             READ    DSALMOUT      ISS WARNING IS ON.
0503  REF   80  LAST 1397    07,3435  7 4712 0             MASK    BIT1
0504  REF  382  LAST 1403    07,3436  10 000 0             CCS     A
0505  REF    4  LAST 1403    07,3437  1 3441 1             TCF     IMUBAD

0506  REF    3  LAST  578    07,3440  1 3467 0  IMUGOOD   TCF     GOODEND       WITH C(A) = 0.

0507  REF  260  LAST 1402    07,3441  3 4714 1  IMUBAD    CAF     ZERO
0508  REF    2  LAST  578    07,3442  1 3464 0             TCF     BADEND

0509  REF   52  LAST 1398    07,3443  3 4705 1  CAGETEST  CAF     BIT6          SUBROUTINE TO TERMINATE IMU MODE
0510  REF   60  LAST 1397    07,3444  7 1320 0             MASK    IMODES30      SWITCH IF IMU HAS BEEN CAGED.
0511  REF  383  LAST 1406    07,3445  10 000 0             CCS     A
0512  REF    5  LAST 1406    07,3446  1 3441 1             TCF     IMUBAD        DIRECTLY.
0513  REF  324  LAST 1401    07,3447  0 0002 0             TC      Q             WITH C(A) = +0.

0514  REF   61  LAST 1406    07,3450  4 1320 0  CAGETSTQ  CS      IMODES30      SKIP IF IMU NOT BEING CAGED.
0515  REF   53  LAST 1406    07,3451  7 4705 0             MASK    BIT6
0516  REF  384  LAST 1406    07,3452  10 000 0             CCS     A
0517  REF  325  LAST 1406    07,3453  24 002 0             INCR    Q
0518  REF  326  LAST 1406    07,3454  0 0002 0             TC      Q

0519  REF   62  LAST 1406    07,3455  4 1320 0  CAGETSTJ  CS      IMODES30      IF DURING MODE SWITCH INITIALIZATION
0520  REF   54  LAST 1406    07,3456  7 4705 0             MASK    BIT6          IT IS FOUND THAT THE IMU IS BEING CAGED,
0521  REF  385  LAST 1406    07,3457  10 000 0             CCS     A             SET IMUCADR TO -0 TO INDICATE OPERATION
0522  REF  327  LAST 1406    07,3460  0 0002 0             TC      Q             COMPLETE BUT FAILED. RETURN IMMEDIATELY

0523  REF  261  LAST 1406    07,3461  4 4714 0             CS      ZERO          TO SWRETURN.
0524  REF    3  LAST 1195    07,3462  55=322 1             TS      IMUCADR
0525  REF    7  LAST 1398    07,3463  1 2557 0             TCF     MODEEXIT
```

```
P0526           GENERALIZED MODE SWITCHING TERMINATION. ENTER AT GOODEND FOR SUCCESSFUL COMPLETION OF AN I/O OPERATION
R0528   OR AT BADEND FOR A N UNSUCCESSFUL ONE. C(A) OR ARRIVAL =0 FOR IMU, 1 FOR OPTICS.

 0530   REF  12  LAST 1405   07,3464  54 071 0  BADEND   TS     RUPTREG2      DEVICE INDEX.
 0531   REF 262  LAST 1406   07,3465  4 4714 0           CS     ZERO          FOR FAILURE.
 0532   REF   4  LAST 1406   07,3466  1 3471 1           TCF    GOODEND +2

 0533   REF  13  LAST 1407   07,3467  54 071 0  GOODEND  TS     RUPTREG2
 0534   REF 161  LAST 1399   07,3470  4 4712 0           CS     ONE           FOR SUCCESS.

 0535   REF   6  LAST 1379   07,3471  54 072 0           TS     RUPTREG3
 0536   REF  14  LAST 1407   07,3472  50 071 1           INDEX  RUPTREG2      SEE IF USING PROGRAM ASLEEP.
 0537   REF   5  LAST  237   07,3473  11=322 1           CCS    MODECADR
 0538                        07,3474  1 3476 0           TCF    +2            YES - WAKE IT UP.
 0539   REF   1              07,3475  1 3506 0           TCF    ENDMODE       IF 0, PROGRAM NOT IN YET.

 0540   REF 263  LAST 1407   07,3476  3 4714 1           CAF    ZERO          WAKE SLEEPING PROGRAM.
 0541   REF  15  LAST 1407   07,3477  50 071 1           INDEX  RUPTREG2
 0542   REF   6  LAST 1407   07,3500  57=322 0           XCH    MODECADR
 0543   REF   7  LAST 1400   07,3501  0 5074 1           TC     JOBWAKE

 0544   REF   7  LAST 1407   07,3502  4 0072 0           CS     RUPTREG3      ADVANCE LOC IF SUCCESSFUL.
 0545   REF  23  LAST 1294   07,3503  50 064 0           INDEX  LOCCTR
 0546   REF  41  LAST 1190   07,3504  26 164 0           ADS    LOC

 0547   REF  71  LAST 1403   07,3505  1 5213 0           TCF    TASKOVER

 0548   REF   8  LAST 1407   07,3506  3 0072 1  ENDMODE  CA     RUPTREG3      -0 INDICATES OPERATION COMPLETE BUT
 0549   REF  16  LAST 1407   07,3507  50 071 1           INDEX  RUPTREG2      UNSUCCESSFUL - -1 INDICATES COMPLETE AND
 0550   REF   7  LAST 1407   07,3510  55=322 1           TS     MODECADR      SUCCESSFUL.
 0551   REF  72  LAST 1407   07,3511  1 5213 0           TCF    TASKOVER
```

```
P0552           GENERAL STALLING ROUTINE. USING PROGRAMS COME HERE TO WAIT FOR I/O COMPLETION.

R0554   PROGRAM DESCRIPTION                                  DATE- 21 FEB 1967
R0555                                                  LOG SECTION IMU MODE SWITCHING
R0556   MOD BY- R.MELANSON TO ADD DOCUMENTATION          ASSEMBLY SUNDISK REV. 82

R0557   FUNCTIONAL DESCRIPTION-
R0558     TO DELAY FURTHER EXECUTION OF THE CALLING ROUTINE UNTIL ITS SELECTED
R0559     I/O FUNCTION IS COMPLETE.THE FOLLOWING CHECKS ON THE CALLING ROUTINE'S
R0560     MODECADR ARE MADE AND ACTED UPON.
R0561       1) +0 INDICATES INCOMPLETE I/O OPERATION.CALLING ROUTINE IS PUT TO
R0562          SLEEP.
R0563       2) -1 INDICATES COMPLETED I/O OPERATION. STALL BYPASSES JOBSLEEP
R0564          CALL AND RETURNS TO CALLING ROUTINE AT L+3
R0565       3) -0 INDICATES COMPLETED I/O WITH FAILURE. STALL CLEARS MODECADR
R0566          AND RETURNS TO CALLING ROUTINE AT L+2.
R0567       4) VALUE GREATER THAN 0 INDICATES TWO ROUTINES CALLING FOR USE OF
R0568          SAME DEVICE. STALL EXITS TO ABORT WHICH EXECUTES A PROGRAM
R0569          RESTART WHICH IN TURN CLEARS ALL MODECADR REGISTERS.

R0570   CALLING SEQUENCE-
R0571     L   TC   BANKCALL
R0572     L+1 CADR (ONE OF 5 STALL ADDRESSES I.E. IMUSTALL,OPTSTALL,RADSTALL,
R0573              AOTSTALL,OR ATTSTALL)

R0574   NORMAL-EXIT MODE-
R0575     TCF   JOBSLEEP OR TCF  MODEXIT

R0576   ALARM OR ABORT EXIT MODE-
R0577     TC   ABORT

R0578   OUTPUT-
R0579     MODECADR= CADR IF JOBSLEEP
R0580     MODECADR=+0     IF I/O COMPLETE
R0581     BUF2=L+3        IF I/O COMPLETE AND GOOD.
R0582     BUF2=L+2 IF I/O COMPLETE BUT FAILED.

R0583   ERASABLE INITIALIZATION-
R0584     BUF2 CONTAINS RETURN ADDRESS PLUS 1,(L+2)
R0585     BUF2+1 CONTAINS FBANK VALUE OF CALLING ROUTINE.
R0586     MODECADR OF CALLING ROUTINE CONTAINS +0,-1,-0 OR  CADR RETURN ADDRESS.

R0587   DEBRIS-
R0588     RUPTREG2 AND CALLING ROUTINE MODECADR.

 0589   REF 162  LAST 1407   07,3512  3 4712 1  AOTSTALL CAF    ONE          AOT.
 0590   REF   1              07,3513  0 3517 1           TC     STALL

 0591   REF  74  LAST 1398   07,3514  3 4711 1  RADSTALL CAF    TWO
 0592   REF   2  LAST 1408   07,3515  1 3517 0           TCF    STALL
```

```
0593   REF   1                07,3512                OPTSTALL EQUALS AOTSTALL

0594   REF 264  LAST 1407     07,3516  3 4714 1  IMUSTALL CAF    ZERO          IMU.

0595                          07,3517  0 0004 0  STALL    INHINT
0596   REF  17  LAST 1407     07,3520  54 071 0           TS     RUPTREG2      SAVE DEVICE INDEX.
0597   REF 386  LAST 1406     07,3521  50 000 1           INDEX  A             SEE IF OPERATION COMPLETE.
0598   REF   8  LAST 1407     07,3522  11=322 1           CCS    MODECADR
0599   REF   1                07,3523  1 3541 0           TCF    MODABORT      ALLOWABLE STATES ARE +0, -1, AND -0.
0600   REF   1                07,3524  1 3535 0           TCF    MODESLP       OPERATION INCOMPLETE.
0601   REF   1                07,3525  1 3531 1           TCF    MODEGOOD      COMPLETE AND GOOD IF = -1.

0602   REF  18  LAST 1409     07,3526  50 071 1  MG2      INDEX  RUPTREG2      COMPLETE AND FAILED IF -0. RESET TO +0.
0603   REF   9  LAST 1409     07,3527  55=322 1           TS     MODECADR      RETURN TO CALLER.
0604   REF   8  LAST 1406     07,3530  1 2557 0           TCF    MODEEXIT

0605   REF 387  LAST 1409     07,3531  10 000 0  MODEGOOD CCS    A             MAKE SURE INITIAL STATE -1.
0606   REF   2  LAST 1409     07,3532  1 3541 0           TCF    MODABORT

0607   REF  22  LAST 1399     07,3533  24 133 0           INCR   BUF2          IF SO, INCREMENT RETURN ADDRESS AND
0608   REF   1                07,3534  1 3526 1           TCF    MG2           RETURN IMMEDIATELY, SETTING CADR = +0.

0609   REF   5  LAST  730     07,3535  0 4604 1  MODESLP  TC     MAKECADR      CALL FROM SWITCHABLE FIXED ONLY.
0610   REF  19  LAST 1409     07,3536  50 071 1           INDEX  RUPTREG2
0611   REF  10  LAST 1409     07,3537  55=322 1           TS     MODECADR
0612   REF   6  LAST 1399     07,3540  1 5070 1           TCF    JOBSLEEP

0613   REF   4  LAST 1154     07,3541  0 5622 1  MODABORT TC     POODOO        TWO PROGRAMS USING SAME DEVICE.
0614                          07,3542   01210 0           OCT    1210
```

P0615 CONSTANTS FOR MODE SWITCHING ROUTINES

```
0616  REF   4  LAST 1011      5656              BITS3d4  =       OCT14
0617  REF   5  LAST 1364      4726              BITS4d6  =       OCT50
0618                       07,3543   00030 1    BITS4-5  OCT     00030
0619  REF  31  LAST 1402      4703              IMUSEFLG EQUALS  BIT8      INTERPRETER SWITCH 7.
0620                       07,3544   77500 1    -COMMAX  DEC     -191
0621                       07,3545   77477 0    -COMMAX- DEC     -192
0622                       07,3546   00074 1    600MS    DEC     60
0623  REF   3  LAST  417    07,3012              IMUPIN20 =       IMUFINE
0624  REF   4  LAST  411    07,3547   3 1325 1   GOMANUR  CA      ATTCADR    IS KALCMANU FREE
0625                       07,3550   0 0006 1             EXTEND
0626                       07,3551   1 3554 1             BZF     +3

0627  REF   5  LAST 1409    07,3552   0 5622 1             TC      POODOO     NO
0628                       07,3553    01210 0             OCT     1210       2 TRYING TO USE SAME DEVICE

0629                       07,3554   0 0006 1   +3        EXTEND
0630  REF  23  LAST 1409    07,3555   3 0134 1             DCA     BUP2
0632  REF   5  LAST 1410    07,3556   53=326 0             DXCH    ATTCADR    SAVE FINAL RETURN FOR KALCMAN3

0633  REF  34  LAST 1379    07,3557   3 0006 1             CA      BBANK
0634  REF  22  LAST 1401    07,3560   7 4716 1             MASK    SEVEN
0635  REF   6  LAST 1410    07,3561   27=326 0             ADS     ATTCADR +1

0642  REF  27  LAST 1188    07,3562   3 0167 1             CA      PRIORITY
0643  REF   2  LAST  198    07,3563   7 7674 1             MASK    PRIO37
0644  REF   2  LAST  411    07,3564   55=327 1             TS      ATTPRIO    SAVE USERS PRIO

06452 REF   1                07,3565   3 3571 1             CAF     KALEBCON   SET EBANK FOR KALCMAN3
06453 REF  62  LAST 1403     07,3566   54 003 0             TS      EBANK
06454 REF  62  LAST 1365     07,3567   0 4574 0             TC      POSTJUMP
06455 REF   1                07,3570    44000 1             CADR    KALCMAN3
06456 REF  16  LAST  410     07,3571    03261 1  KALEBCON   ECADR   BCDU
```

```
P0646   PROGRAM DESCRIPTION
R0647   IMU STATUS CHECK ROUTINE R02  (SUBROUTINE UTILITY)
R0648   MOD NO - 1
R0649   MOD BY - N.BRODEUR
R0650   FUNCTIONAL DESCRIPTION
R0651
R0652   TO CHECK WHETHER IMU IS ON AND IF ON WHETHER IT IS ALIGNED TO AN
R0653   ORIENTATION KNOWN BY THE CMC. TO REQUEST SELECTION OF THE APPROPRIATE
R0654   PROGRAM IF THE IMU IS OFF OR NOT ALIGNED TO AN ORIENTATION KNOWN BY THE
R0655   CMC. CALLED THROUGH BANKCALL
R0656   CALLING SEQUENCE-
R0657
R0658   L       TC      BANKCALL
R0659   L+1     CADR    R02BOTH
R0660   SUBROUTINES CALLED
R0661
R0662         VARALARM
R0663         FLAGUP
R0664   NORMAL EXIT MODES
R0665
R0666   AT L+2 OF CALLING SEQUENCE
R0667   ALARM OR ABORT EXIT MODES
R0668         GOTOPOOH, WITH ALARM
R0673   ERASABLE INITIALIZATION REQUIRED
R0674
R0675   NONE
R0676   DEBRIS
R0677
R0678   CENTRALS-A,Q,L
 0679                          34,3775                          BANK    34
 0680   REF   1                07,2000                          SETLOC  R02
 0681                          07,3572                          BANK
 0682   REF   1                                                 COUNT   04/R02          COUNT*

 0683                          07,3572   00063 1  DEC51         DEC     51
 0684   REF  50  LAST 1401     07,3573   3 4676 1  R02BOTH      CAF     BIT13
 0685   REF  51  LAST 1168     07,3574   7 0077 0               MASK    STATE +3        REFSMFLG
 0686   REF 388  LAST 1409     07,3575   10 000 0               CCS     A
 0687   REF   2  LAST  722     07,3576   0 3607 0               TC      R02ZERO         ZERO IMUS

 0688   REF  63  LAST 1406     07,3577   3 1320 1               CA      IMODES30
 0689   REF  37  LAST 1405     07,3600   7 4702 1               MASK    BIT9            IS ISS INITIALIZED
 0690                          07,3601   0 0006 1               EXTEND
 0691                          07,3602   1 3604 1               BZF     +2
 0692   REF  48  LAST 1403     07,3603   4 4707 1               CS      BIT4            SEND IMU ALARM CODE 210
 0693   REF   1                07,3604   6 3612 1               AD      OCT220          SEND REFSMM ALARM
 0694   REF   3  LAST  853     07,3605   0 5651 0               TC      VARALARM

 0695   REF  70  LAST  853     07,3606   0 4106 1               TC      GOTOPOOH
```

L IMU MODE SWITCHING ROUTINES USER=S PAGE NO. 25 E3 S4

```
07700   REP  52  LAST 1328   07,3607  0 5435 0  R02ZERO  TC      UPFLAG
07701   REP   4  LAST  420   07,3610   00007 0            ADRES   IMUSE
07702   REP   9  LAST 1397   07,3611  1 4570 0            TCF     SWRETURN
07025                        07,3612   00220 1  OCT220    OCT     220
```

P0703 PROGRAM DESCRIPTION P06 10FEB67

R0704 TRANSFER THE ISS/CMC FROM THE OPERATE TO THE STANDBY CONDITION.

R0705 THE NORMAL CONDITION OF READINESS OF THE GNCS WHEN NOT IN USE IS STANDBY. IN THIS CONDITION THE IMU
R0707 HEATER POWER IS ON. THE IMU OPERATE POWER IS OFF. THE COMPUTER POWER IS ON. THE OPTICS POWER IS OFF. THE
R0709 CMC STANDBY ON THE MAIN AND LEB DISKYS IS ON.

R0710 CALLING SEQUENCE'
R0711 ASTRONAUT REQUEST THROUGH DSKY V37E 06E.

R0712 SUBROUTINES CALLED'
R0713 GOPERF1
R0716 BANKCALL
R0719 FLAGDOWN

```
P0810   PRESTAND PREPARES FOR STANDBY BY SNAPSHOTTING THE SCALER AND TIME1 TIME2
R0811   THE LOW 5 BITS OF THE SCALER ARE INSPECTED TO INSURE COMPATABILITY
R0812   BETWEEN THE SCALER READING AND THE TIME1 TIME2 READING.

 08125  REF   1                 26,2000                    SETLOC  P05P06
 08126                          26,3655                    BANK

 0813   REF   3  LAST  202        1150                    EBANK=  TIME2SAV
 0814   REF   1                                           COUNT*  $$/P06

 08145  REF  53  LAST 1412      26,3655  0 5435 0  P06     TC      UPFLAG          SET NODOV37 BIT
 08146  REF   3  LAST 1284      26,3656   00054 0          ADRES   NODOFLAG

 0815                           26,3657  0 0004 0  PRESTAND INHINT
 0816                           26,3660  0 0006 1           EXTEND
 0817   REF  31  LAST 1386      26,3661  3 0025 0           DCA     TIME2           SNAPSHOT TIME1TIME2
 0818   REF   4  LAST 1414      26,3662  53=151 1           DXCH    TIME2SAV
 0819   REF   1                 26,3663  0 3714 0           TC      SCALPREP
 0820   REF   1                 26,3664  0 3657 0           TC      PRESTAND        T1,T2,SCALER NOT COMPATIBLE
 0821   REF 687  LAST 1399      26,3665  52 155 1           DXCH    MPAC            T1,T2 AND SCALER OK
 0822   REF   1                 26,3666  53=153 0           DXCH    SCALSAVE        STORE SCALER
 0823                           26,3667  0 0004 0           INHINT
 0824   REF 246  LAST 1037      26,3670  0 4555 0           TC      BANKCALL
 0825   REF   3  LAST  150      26,3671   16777 1           CADR    RNDREFDR        REFSMM, DRIFT, TRACK FLAGS DOWN

 0826   REF  55  LAST 1284      26,3672  0 5447 0           TC      DOWNFLAG
 0827   REF   5  LAST 1412      26,3673   00007 0          ADRES   IMUSE           IMUSE DOWN
 08271  REF  56  LAST 1414      26,3674  0 5447 0           TC      DOWNFLAG
 08272  REF   5  LAST  610      26,3675   00010 0          ADRES   RNDVZFLG        RNDVZFLG DOWN

 0828   REF  37  LAST 1390      26,3676  3 4700 1           CAF     BIT11
 0829                           26,3677  0 0006 1           EXTEND
 0830   REF  14  LAST 1068      26,3700  05 013 0           WOR     CHAN13          SET STANDBY ENABLE BIT

 0831   REF 101  LAST 1377      26,3701  0 5301 0           TC      PHASCHNG        SET RESTART TO POSTAND WHEN STANDBY
 0832                           26,3702   07024 0          OCT     07024             RECOVERS
 0833                           26,3703   20000 0          OCT     20000
 08335  REF   2  LAST 1414        1152                    EBANK=  SCALSAVE
 0834   REF   1                 26,3704   03734 1          2CADR   POSTAND
 0834   REF   1                 26,3705   54102 0
 0835   REF   1                 26,3706  3 4731 0           CAF     OCT62
 0836   REF 247  LAST 1414      26,3707  0 4555 0           TC      BANKCALL
 0837   REF   7  LAST  736      26,3710   20751 0          CADR    GOPERF1
 0838                           26,3711  1 3706 1           TCF     -3
 0839                           26,3712  1 3706 1           TCF     -4
 0840                           26,3713  1 3706 1           TCF     -5

 08405  REF   9  LAST 1037        4731            OCT62    EQUALS  .5SEC          DEC 50 = OCT 62

R0841   THE LOW 5 BITS OF THE SCALER READS 10000 FOR THE FIRST INTERVAL AFTER A
```

R0842 T1 INCREMENT. IF SCALPREP DETECTS THIS INTERVAL THE T1,T2 AND SCALER
R0843 DATA ARE NOT COMPATABLE AND RETURN IS TO L+1 FOR ANOTHER READING OF THE
R0844 DATA. OTHERWISE, THE RETURN IS TO L+2 TO PROCEED. ROUTINE ALSO PREPARES
R0845 THE SCALER READING FOR COMPUTATION OF THE INCREMENT TO UPDATE T1T2. (THE
R0846 10 MS BIT (BIT 6) OF THE SCALER IS INCREMENTED 5 MS OUT OF PHASE FROM
R0847 T1.) ADDITION OF 5 MS (BIT 5) TO THE SCALER READING HAS THE EFFECT OF
R0848 ADJUSTING BIT 6 IN THE SCALER TO BE IN PHASE WITH BIT 1 OF T1. THE LOW 5
R0849 BITS OF THE SCALER READING ARE THEN SET TO ZERO, TO TRUNCATE THE SCALER
R0850 DATA TO 10 MS. RESULTS ARE STORED IN MPAC, +1.

```
0851                        26,3714  0 0006 1  SCALPREP EXTEND
0852  REF 688  LAST 1414   26,3715  22 156 0          QXCH   MPAC    +2
0853  REF   3  LAST  424   26,3716  0 4527 0          TC     FINETIME +1
0854                        26,3717  0 0003 1          RELINT
0855  REF 689  LAST 1415   26,3720  52 155 1          DXCH   MPAC
0856  REF  44  LAST 1396   26,3721  3 4706 1          CA     BIT5          ADD 5 MS TO THE SCALER READING.
0857  REF 226  LAST 1402   26,3722  54 001 1          TS     L
0858  REF 265  LAST 1409   26,3723  3 4714 1          CA     ZERO
0859  REF 690  LAST 1415   26,3724  20 155 1          DAS    MPAC
0860  REF   9  LAST  356   26,3725  4 4362 0          CS     LOW5          SET LOW 5 BITS OF (SCALER+5MS) TO ZERO
0861  REF 691  LAST 1415   26,3726  7 0155 1          MASK   MPAC    +1     AND STORE RESULTS IN MPAC,+1.
0862  REF 692  LAST 1415   26,3727  56 155 0          XCH    MPAC    +1
0863  REF  10  LAST 1415   26,3730  7 4362 0          MASK   LOW5          TEST LOW 5 BITS OF SCALER FOR THE FIRST
A0864                                                                     INTERVAL AFTER THE T1 INCREMENT
A0865                                                                     (NOW = 00000, SINCE BIT 5 ADDED).
0866  REF 389  LAST 1411   26,3731  10 000 0          CCS    A             IS IT 1ST INTERVAL AFTER T1 INCREMENT
0867  REF 693  LAST 1415   26,3732  24 156 0          INCR   MPAC +2       NO
0868  REF 694  LAST 1415   26,3733  0 0156 0          TC     MPAC +2       YES
```

R0869 POSTAND RECOVERS TIME AFTER STANDBY.THE SCALER IS SNAPSHOTTED AND THE
R0870 $TIME_1$ $TIME_2$ COUNTER IS SET TO ZERO. THE LOW 5 BITS OF THE SCALER ARE
R0871 INSPECTED TO INSURE COMPATABILITY BETWEEN THE SCALER READING AND THE
R0872 CLEARING OF THE TIME COUNTER. IT THEN COMPUTES THE DIFFERENCE IN SCALER
R0873 VALUES (IN DP) AND ADDS THIS TO THE PREVIOUSLY SNAPSHOTTED VALUES OF
R0874 $TIME_1$ $TIME_2$ AND PLACES THIS NEW TIME INTO THE $TIME_1$ $TIME_2$ COUNTER.

```
0875  REF   1                                         COUNT* $$/P05

0876  REF  38  LAST 1414   26,3734  4 4700 0  POSTAND  CS     BIT11         RECOVER TIME AFTER STANDBY.
0877                        26,3735  0 0006 1          EXTEND
0878  REF  15  LAST 1414   26,3736  03 013 0          WAND   CHAN13        CLEAR STANDBY ENABLE BIT
0879                        26,3737  0 0004 0          INHINT
0880  REF 266  LAST 1415   26,3740  3 4714 1          CA     ZERO
0881  REF 227  LAST 1415   26,3741  54 001 1          TS     L
0882  REF  32  LAST 1414   26,3742  52 025 1          DXCH   TIME2         CLEAR TIME1TIME2
0883  REF   2  LAST 1414   26,3743  0 3714 0          TC     SCALPREP      STORE SCALER IN MPAC, MPAC+1
0884  REF   2  LAST 1414   26,3744  0 3737 1          TC     POSTAND +3    T1,T2,SCALER NOT COMPATIBLE
0885                        26,3745  0 0006 1          EXTEND               T1,T2 AND SCALER OK
0886  REF   3  LAST 1414   26,3746  4 1153 0          DCS    SCALSAVE
0887  REF 695  LAST 1415   26,3747  20 155 1          DAS    MPAC          FORM DP DIFFERENCE OF POSTSTANDBY SCALER
```

```
0888  REP  46  LAST 1403   26,3750  3 4701 0          CAP   BIT10          MINUS PRESTANDBY SCALER AND SHIFT RIGHT
0889  REP   9  LAST  374   26,3751  0 7256 1          TC    SHORTMP        5 TO ALIGN BITS WITH TIME1TIME2.
0890  REP 267  LAST 1415   26,3752  3 4714 1          CAP   ZERO
0891  REP 696  LAST 1415   26,3753  54 156 1          TS    MPAC     +2    NEEDED FOR TP AGREE
0892  REP  12  LAST 1398   26,3754  0 7226 0          TC    TPAGREE        MAKE DP DIFF AGREE
0893  REP 697  LAST 1416   26,3755  10 154 0          CCS   MPAC
0894  REP   1              26,3756  0 3763 0          TC    POSTCOM        IF DP DIFF NET +, NO SCALER OVERFLOW
0895  REP   2  LAST 1416   26,3757  0 3763 0          TC    POSTCOM        BETWEEN PRE AND POST STANDBY.
0896                       26,3760  0 3761 1          TC    +1             IF DP DIFF NET -, SCALER OVERFLOWED. ADD
0897  REP  47  LAST 1416   26,3761  3 4701 0          CAP   BIT10          BIT 10 TO HIGH DIFF TO CORRECT.
0898  REP 698  LAST 1416   26,3762  26 154 0          ADS   MPAC
0899                       26,3763  0 0006 1  POSTCOM  EXTEND
0900  REP   5  LAST 1414   26,3764  3 1151 0          DCA   TIME2SAV       C(MPAC,+1) IS MAGNITUDE OF DELTA SCALER.
0901  REP 699  LAST 1416   26,3765  20 155 1          DAS   MPAC           PRESTANDBY TIME1TIME2
0902  REP  13  LAST 1416   26,3766  0 7226 0          TC    TPAGREE        FORCE SIGN AGREEMENT
0903  REP 700  LAST 1416   26,3767  52 155 1          DXCH  MPAC           UPDATED VALUE FOR T1,T2.
0904  REP  33  LAST 1415   26,3770  20 025 1          DAS   TIME2          LOAD UPDATED VALUE INTO T1,T2, WITH
09045 REP  57  LAST 1414   26,3771  0 5447 0          TC    DOWNFLAG       CLEAR NODOFLAG
09046 REP   4  LAST 1414   26,3772   00054 0          ADRES NODOFLAG

0905  REP  71  LAST 1411   26,3773  0 4106 1          TC    GOTOPOOH
```

```
0001                              14,3744                          BANK    14
0002  REF    1                    07,2000                          SETLOC  KEYRUPT
0003                              07,3613                          BANK
0004  REF    1                                                     COUNT*  $$/KEYUP

0005  REF   25  LAST 1202   07,3613  54 016 1  KEYRUPT1  TS      BANKRUPT
0006  REF  328  LAST 1406   07,3614  56 002 0            XCH     Q
0007  REF   20  LAST 1202   07,3615  54 012 0            TS      QRUPT
0008  REF    2  LAST  350   07,3616  0 4414 1            TC      LODSAMPT      TIME IS SNATCHED IN RUPT FOR NOUN 65.
0009  REF   11  LAST 1415   07,3617  3 4362 1            CAF     LOW5
0010                        07,3620  0 0006 1            EXTEND
0011  REF    2  LAST  185   07,3621  02 015 1            RAND    MNKEYIN       CHECK IF KEYS 5M-1M ON
0012  REF    6  LAST 1379   07,3622  54 073 1  KEYCOM    TS      RUPTREG4
0013  REF   14  LAST  654   07,3623  4 0101 0            CS      FLAGWRD5
0014  REF   53  LAST 1396   07,3624  7 4674 1            MASK    BIT15
0015  REF   15  LAST 1417   07,3625  26 101 0            ADS     FLAGWRD5

0016  REF    6  LAST 1174   07,3626  3 4371 0  ACCEPTUP  CAF     CHRPRIO       (NOTE' RUPTREG4 = KEYTEMP1)
0017  REF   33  LAST 1387   07,3627  0 5027 1            TC      NOVAC
0018  REF   66  LAST  370      0777                      EBANK=  DSPCOUNT
0019  REF    1                07,3630   02000 0         2CADR   CHARIN
0019  REF    1                07,3631   60101 1
0020  REF    7  LAST 1417   07,3632  3 0073 0            CA      RUPTREG4
0021  REF   24  LAST 1407   07,3633  50 064 0            INDEX   LOCCTR
0022  REF  701  LAST 1416   07,3634  54 154 0            TS      MPAC          LEAVE 5 BIT KEY CDE IN MPAC FOR CHARIN
0023  REF   48  LAST 1069   07,3635  0 5222 0            TC      RESUME
```

L KEYRUPT, UPRUPT USER'S PAGE NO. 2 E0 S4

P0024 UPRUPT PROGRAM

```
0025  REF  26  LAST 1417   07,3636  54 016 1  UPRUPT   TS    BANKRUPT
0026  REF 329  LAST 1417   07,3637  56 002 0           XCH   Q
0027  REF  21  LAST 1417   07,3640  54 012 0           TS    QRUPT
0028  REF   3  LAST 1417   07,3641  0 4414 1           TC    LODSAMPT      TIME IS SNATCHED IN RUPT FOR NOUN 65.
0029  REF 268  LAST 1416   07,3642  3 4714 1           CAF   ZERO
0030  REF   2  LAST  188   07,3643  56 045 0           XCH   INLINK
0031  REF   2  LAST  128   07,3644  54 073 1           TS    KEYTEMP1
0032  REF  34  LAST 1383   07,3645  3 4710 0           CAF   BIT3          TURN ON UPACT LIGHT
0033                       07,3646  0 0006 1           EXTEND              (BIT 3 OF CHANNEL 11)
0034  REF  34  LAST 1408   07,3647  05 011 1           WOR   DSALMOUT
0035  REF  12  LAST 1417   07,3650  3 4362 1  UPRPT1   CAF   LOW5          TEST FOR TRIPLE CHAR REDUNDANCY
0036  REF   3  LAST 1418   07,3651  7 0073 1           MASK  KEYTEMP1      LOW5 OF WORD
0037  REF   4  LAST 1418   07,3652  56 073 0           XCH   KEYTEMP1      LOW5 INTO KEYTEMP1
0038                       07,3653  0 0006 1           EXTEND
0039  REF  48  LAST 1416   07,3654  7 4701 1           MP    BIT10         SHIFT RIGHT 5
0040  REF   1              07,3655  54 734 0           TS    KEYTEMP2
0041  REF  13  LAST 1418   07,3656  7 4362 0           MASK  LOW5          MID 5
0042  REF   1              07,3657  6 3713 1           AD    HI10
0043  REF   1              07,3660  0 3710 1           TC    UPTEST
0044  REF  49  LAST 1418   07,3661  3 4701 0           CAF   BIT10
0045                       07,3662  0 0006 1           EXTEND
0046  REF   2  LAST 1418   07,3663  7 0734 0           MP    KEYTEMP2      SHIFT RIGHT 5
0047  REF  14  LAST 1418   07,3664  7 4362 0           MASK  LOW5          HIGH 5
0048                       07,3665  4 0000 0           COM
0049  REF   2  LAST 1418   07,3666  0 3710 1           TC    UPTEST

0050  REF   1              07,3667  4 3716 0  UPOK     CS    ELRCODE       CODE IS GOOD. IF CODE = "ERROR RESET",
0051  REF   5  LAST 1418   07,3670  6 0073 0           AD    KEYTEMP1      CLEAR UPLOCKFL(SET BIT4 OF FLAGWRD7 = 0)
0052                       07,3671  0 0006 1           EXTEND              IF CODE DOES NOT = "ERROR RESET", ACCEPT
0053  REF   1              07,3672  1 3700 1           BZF   CLUPLOCK      CODE ONLY IF UPLOCKFL IS CLEAR (=0).

0054  REF  49  LAST 1411   07,3673  3 4707 0           CAF   BIT4          TEST UPLOCKFL FOR 0 OR 1.
0055  REF  19  LAST  777   07,3674  7 0103 1           MASK  FLAGWRD7
0056  REF 390  LAST 1415   07,3675  10 000 0           CCS   A
0057  REF  49  LAST 1417   07,3676  0 5222 0           TC    RESUME        UPLOCKFL = 1
0058  REF   1              07,3677  0 3626 0           TC    ACCEPTUP      UPLOCKFL = 0

0059  REF  50  LAST 1418   07,3700  4 4707 1  CLUPLOCK CS    BIT4          CLEAR UPLOCKFL (I.E., SET BIT4 OF
0060  REF  20  LAST 1418   07,3701  7 0103 1           MASK  FLAGWRD7      FLAGWRD7 = 0)
0061  REF  21  LAST 1418   07,3702  54 103 1           TS    FLAGWRD7
0062  REF   2  LAST 1418   07,3703  0 3626 0           TC    ACCEPTUP

A0063
0064  REF  22  LAST 1418   07,3704  4 0103 1  TMFAIL2  CS    FLAGWRD7      CODE IS BAD
0065  REF  51  LAST 1418   07,3705  7 4707 1           MASK  BIT4          LOCK OUT FURTHER UPLINK ACTIVITY
0066  REF  23  LAST 1418   07,3706  26 103 1           ADS   FLAGWRD7      (BY SETTING UPLOCKFL = 1) UNTIL
0067  REF  50  LAST 1418   07,3707  0 5222 0           TC    RESUME        "ERROR RESET" IS SENT VIA UPLINK.
0069  REF   6  LAST 1418   07,3710  6 0073 0  UPTEST   AD    KEYTEMP1
```

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```
 0070   REF 391  LAST 1418   07,3711  10 000 0          CCS   A
 0071   REF   1               07,3712  0 3704 1          TC    IMPAIL2
 0072                         07,3713   77740 1  HI10    OCT   77740
 0073   REF   2  LAST 1419   07,3714  0 3704 1          TC    IMPAIL2
 0074   REF 330  LAST 1418   07,3715  0 0002 0          TC    Q

 0075                         07,3716   00022 1  ELRCODE OCT   22

R0076   «UPLINK ACTIVITY LIGHT« IS TURNED OFF BY .....
R0077            1.    VBRELDSP
R0078            2.    ERROR RESET
R0079            3.    UPDATE PROGRAM(P27) ENTERED BY V70,V71,V72,AND V73.
R0080
R0081   THE RECEPTION OF A BAD CODE(I.E  CCC FAILURE) LOCKS OUT FURTHER UPLINK ACTIVITY BY SETTING BIT4 OF FLAGWRD7 = 1.
R0083   THIS INDICATION WILL BE TRANSFERRED TO THE GROUND BY THE DOWNLINK WHICH DOWNLINKS ALL FLAGWORDS.
R0085   WHEN UPLINK ACTIVITY IS LOCKED OUT ,IT CAN BE ALLOWED WHEN THE GROUND UPLINKS AND «ERROR RESET« CODE.
R0087   (IT IS RECOMMENDED THAT THE «ERROR LIGHT RESET« CODE IS PRECEEDED BY 16 BITS THE FIRST OF WHICH IS 1 FOLLOWED
R0089   BY 15 ZEROES. THIS WILL ELIMINATE EXTRANEOUS BITS FROM INLINK WHICH MAY HAVE BEEN LEFT OVER FROM THE ORIGINAL
R0091   FAILURE)
R0092   UPLINK ACTIVITY IS ALSO ALLOWED(UNLOCKED) DURING FRESH START WHEN FRESH START SETS BIT4 OF FLAGWRD7 = 0.
```

L DISPLAY INTERFACE ROUTINES USER'S PAGE NO. 1 E0 S4

R0001 DISPLAYS CAN BE CLASSIFIED INTO THE FOLLOWING CATEGORIES-

R0002 1. PRIORITY DISPLAYS- DISPLAYS WHICH TAKE PRIORITY OVER ALL OTHER DISPLAYS. USUALLY THESE DISPLAYS ARE SENT
R0004 OUT UNDER CRITICAL ALARM CONDITIONS.
R0005 2. EXTENDED VERB DISPLAYS- ALL EXTENDED VERBS AND MARK ROUTINES SHOULD USE EXTENDED VERB (MARK) DISPLAYS.
R0007 3. NORMAL DISPLAYS- ALL MISSION PROGRAM DISPLAYS WHICH INTERFACE WITH THE ASTRONAUT DURING THE NORMAL
R0009 SEQUENCE OF EVENTS.
R0010 4. MISC. DISPLAYS- ALL DISPLAYS NOT HANDLED BY THE DISPLAY INTERFACEROUTINES. THESE INCLUDE SUCH DISPLAYS AS
R0012 MM DISPLAYS AND SPECIAL PURPOSE DISPLAYS HANDLED BY PINBALL.
R0013 5. ASTRONAUT INITIATED DISPLAYS- ALL DISPLAYS INITIATED EXTERNALLY.
R0014 THE FOLLOWING TERMS ARE USED TO DESCRIBE THE STATUS OF DISPLAYS-

R0015 1. ACTIVE-THE DISPLAY WHICH IS (1) BEING DISPLAYED TO THE ASTRONAUT AND WAITING FOR A RESPONSE OR
R0017 (2) WAITING FIRST IN LINE FOR THE ASTRONAUT TO FINISH USING THE DSKY OR (3) BEING DISPLAYED ON THE DSKY
R0019 BUT NOT WAITING FOR A RESPONSE.
R0020 2. INACTIVE -A DISPLAY WHICH HAS (1) BEEN ACTIVE BUT WAS INTERRUPTEDBY A DISPLAY OF HIGHER PRIORITY,
R0022 (2) BEEN PUT INTO THE WAITING LIST AT TIME IT WAS REQUESTED DUE TO THE FACT A HIGHER PRIORITY DISPLAY
R0024 WAS ALREADY GOING, (3) BEEN INTERRUPTED BY THE ASTRONAUT (CALLED A PINBRANCH CONDITION, SINCE THIS TYPE
R0026 OF INACTIVE DISPLAY IS USUALLY REACTIVATED ONLY BY PINBALL) OR (4) A DISPLAY WHICH HAS FINISHED BUT STILL
R0028 HAS INFO SAVED FOR RESTART PURPOSES.
R0029 DISPLAY PRIORITIES WORK AS FOLLOWS-

R0030 INTERRUPTS-
R0031 1. THE ASTRONAUT CAN INTERRUPT ANY DISPLAY WITH AN EXTERNAL DISPLAY REQUEST.
R0033 2. INTERNAL DISPLAYS CAN NOT BE SENT OUT WHEN THE ASTRONAUT IS USING THE DSKY.
R0035 3. PRIORITY DISPLAYS INTERRUPT ALL OTHER TYPES OF INTERNAL DISPLAYS. A PRIORITY DISPLAY INTERRUPTING ANOTHER
R0037 PRIORITY DISPLAY WILL CAUSE AN ABORT UNLESS BIT$_{14}$ IS SET FOR THE LINUS ROUTINE.
R0039 4. A MARK DISPLAY INTERRUPTS ANY NORMAL DISPLAY.
R0040 5. A MARK THAT INTERRUPTS A MARK COMPLETELY REPLACES IT.

R0041 ORDER OF WAITING DISPLAYS-
R0042 1. ASTRONAUT EXTERNAL USE
R0043 2. PRIORITY
R0044 3. INTERRUPTED MARK
R0045 4. INTERRUPTED NORMAL

R0046 5. MARK TO BE REQUESTED (SEE DESCRIPTION OF ENDMARK)
R0047 6. MARK WAITING
R0048 7. NORMAL WAITING

```
P0049  THE DISPLAY ROUTINES ARE INTENDED TO SERVE AS AN INTERFACE BETWEEN THE USER AND PINBALL.  THE
R0051  FOLLOWING STATEMENTS CAN BE MADE ABOUT NORMAL DISPLAYS AND PRIORITY DISPLAYS (A DESCRIPTION OF MARK ROUTINES
R0053  WILL FOLLOW LATER)'

R0054      1.  ALL ROUTINES THAT END IN R HAVE AN IMMEDIATE RETURN TO THE USER.  FOR ALL FLASHING DISPLAYS THIS RETURN
R0056          IS TO THE USERS CALL CADR +4.  FOR THE ONLY NON FLASHING IMMEDIATE RETURN DISPLAY (GODSPR) THIS RETURN
R0058          IS TO THE USERS CALLING LOC +1.
R0059      2.  ALL ROUTINES NOT ENDING IN R DO NOT DO AN IMMEDIATE RETURN TO THE USER.
R0061      3.  ALL ROUTINES THAT END IN R START A SEPARATE JOB (MAKEPLAY) WITH USERS JOB PRIORITY.
R0063      4.  ALL ROUTINES NOT ENDING IN R BRANCH DIRECTLY TO MAKEPLAY WHICH MAKES THESE DISPLAYS A PART OF THE
R0065          USERS JOB.
R0066      5.  ALL DISPLAY ROUTINES ARE CALLED VIA BANKCALL.
R0067      6.  TO RESTART A DISPLAY THE USER WILL GENERALLY USE A PHASE OF ONE WITH DESIRED RESTART GROUP (SEE
R0069          DESCRIPTION OF RESTARTS).
R0070      7.  ALL FLASHING DISPLAYS HAVE 3 RETURNS TO THE USER FROM ASTRONAUT RESPONSES.  A TERMINATE (V34) BRANCHES
R0072          TO THE USERS CALL CADR +1.  A PROCEED (V33) BRANCHES TO THE USERS CALL CADR +2.  AN ENTER OR RECYCLE
R0074          (V32) BRANCHES TO THE USERS CALL CADR +3.
R0075      8.  ALL ROUTINES MUST BE USED UNDER EXECUTIVE CONTROL.

R0076  A DESCRIPTION OF EACH ROUTINE WITH AN EXAMPLE FOLLOWS'

R0077  GODSP IS USED TO DISPLAY A VERB NOUN ARRIVING IN A.  NO RETURN IS MADE TO THE USER.

R0079      1. GODSP IS NOT RESTARTABLE
R0080      2. A VERB PASTE WITH GODSP ALWAYS TURNS ON THE FLASH.
A0081                                          CAF     VXXNYY
A0082                                          TC      BANKCALL
A0083                                          CADR    GODSP

A0084                                  VXXNYY  OCT     0XXYY

R0085  GODSPR IS THE SAME AS GODSP ONLY RETURN IS TO THE USER.

A0086                                          CAF     VXXNYY
A0087                                          TC      BANKCALL
A0088                                          CADR    GODSPR

A0089                                          ...     ...     IMMEDIATE RETURN OF GODSPR

R0090  GOFLASH DISPLAYS A FLASHING VERB NOUN WITH NO IMMEDIATE RETURN TO THE USER. 3 RETURNS ARE POSSIBLE FROM
R0092  THE ASTRONAUT (SEE NO. 7 ABOVE).

A0093                                          CAF     VXXNYY  VXX NYY WILL BE A FLASHING VERB NOUN.
A0094                                          TC      BANKCALL
A0095                                          CADR    GOFLASH
A0096                                          ...     ...     TERMINATE RETURN
A0097                                          ...     ...     PROCEED RETURN
A0098                                          ...     ...     ENTER OR RECYCLE RETURN

R0099  GOPERF1 IS ENTERED WITH DESIRED CHECKLIST VALUE IN A.  GOPERF1 WILL DISPLAY THIS VALUE IN R1 BY MEANS OF A
```

R0101 V01 N25.A FLASHING PLEASE PERFORM ON CHECKLIST (V50 N25) IS THEN DISPLAYED. NO IMMEDIATE RETURN IS MADE TO
R0103 USER (SEE NO. 7 ABOVE).

R0104 GOPERF1 BLANKS REGISTERS R2 AND R3

```
A0105                          CAF    OCTXX          CODE FOR CHECKLIST VALUE XX
A0106                          TC     BANKCALL
A0107                          CADR   GOPERF1
A0108                          ...    ...            TERMINATE RETURN
A0109                          ...    ...            PROCEED RETURN
A0110                          ...    ...            ENTER RETURN
```

R0111 GOPERF2 IS ENTERED WITH A VARIABLE NOUN AND V01 (V00 FOR N10 OR N11) IN A. GOPERF2 WILL FIRST DISPLAY THE
R0113 REQUESTED NOUN BY MEANS OF A V01NYY OR A V00NYY. PLEASE PERFORM ON NOUN (V50 NYY) THEN BECOMES A FLASHING
R0115 DISPLAY. NO IMMEDIATE RETURN IS MADE TO THE USER (SEE NO. 7 ABOVE).

R0116 GOPERF2 DOES NOT BLANK ANY REGISTERS

```
A0117                          CAF    VXXNYY         VARIABLE NOUN YY. XX=00 OR 01.
A0118                          TC     BANKCALL
A0119                          CADR   GOPERF2
A0120                          ...    ...            TERMINATE RETURN
A0121                          ...    ...            PROCEED RETURN
A0122                          ...    ...            ENTER RETURN
```

R0123 GOPERF3 IS USED FOR A PLEASE PERFORM ON A PROGRAM NUMBER. THE DESIRED PROGRAM NO. IS ENTERED IN A. GOPERF3
R0125 DISPLAYS THE NO. BY MEANS OF A V06 N07 FOLLOWED BY A FLASHING V50 N07 FOR A PLEASE PERFORM. NO IMMEDIATE RETURN
R0127 IS MADE TO THE USER (SEE NO. 7 ABOVE).

R0128 GOPERF3 BLANKS REGISTERS R2 AND R3

```
A0129                          CAF    DECXX          REQUEST PERFORM ON PXX
A0130                          TC     BANKCALL
A0131                          CADR   GOPERF3
A0132                          ...    ...            TERMINATE RETURN
A0133                          ...    ...            PROCEED RETURN
A0134                          ...    ...            ENTER RETURN
```

R0135 GOPERF4 IS USED FOR A PLEASE PERFORM ON AN OPTION. THE DESIRED OPTION ISENTERED IN A AND STORED IN OPTION1.
R0137 GOPERF4 DISPLAYS R1 AND R2 BY MEANS OF A V04N06 FOLLOWED BY A FLASHING V50N06 FOR A PLEASE PERFORM. NO
R0139 IMMEDIATE RETURN IS MADE TO THE USER (SEE NO. 7 ABOVE).

```
A0140                          CAF    OCTXX          REQUEST PERFORM ON OPTION XX
A0141                          TC     BANKCALL
A0142                          CADR   GOPERF4
A0143                          ...    ...            TERMINATE RETURN
A0144                          ...    ...            PROCEED RETURN
A0145                          ...    ...            ENTER RETURN
```

R0146 GOPERF4 BLANKS REGISTER R3

R0147 GODSPRET IS USED TO DISPLAY A VERB NOUN ARRIVING IN A WITH A RETURN TO THE USER AFTER THE DISPLAY HAS BEEN SENT
R0149 OUT.

```
A0150                                   CAF     VXXNYY
A0151                                   TC      BANKCALL
A0152                                   CADR    GODSPRET
A0153                                   ...     ...         RETURN TO USER
```

R0154 REGODSP IS USED TO DISPLAY A VERB NOUN ARRIVING IN A. REGODSP IS THE SAME AS GODSP ONLY REGODSP REPLACES ANY
R0156 ACTIVE NORMAL DISPLAY IF ONE WAS ACTIVE.

```
A0157                                   CAF     VXXNYY
A0158                                   TC      BANKCALL
A0159                                   CADR    REGODSP
```

R0160 REFLASH IS THE SAME AS GOFLASH ONLY REFLASH REPLACES ANY ACTIVE NORMAL DISPLAY IF ONE WAS ACTIVE.

```
A0162                                   CAF     VXXNYY      VXX NYY WILL BE A FLASHING VERB NOUN
A0163                                   TC      BANKCALL
A0164                                   CADR    REFLASH
A0165                                   ...     ...         TERMINATE RETURN
A0166                                   ...     ...         PROCEED RETURN
A0167                                   ...     ...         ENTER RETURN
```

A0168 GOFLASHR IS SAME AS GOFLASH ONLY AN IMMEDIATE RETURN IS MADE TO THE USERS CALL CADR +4.

```
A0170                                   CAF     VXXNYY
A0171                                   TC      BANKCALL
A0172                                   CADR    GOFLASHR
A0173                                   ...     ...         TERMINATE RETURN
A0174                                   ...     ...         PROCEED RETURN
A0175                                   ...     ...         ENTER OR RECYCLE RETURN
A0176                                   ...     ...         IMMEDIATE RETURN FROM GOFLASHR
```

R0177 GOPERF1R IS THE SAME AS GOPERF1 ONLY GOPERF1R HAS AN IMMEDIATE RETURN TOUSERS CALL CADR +4.

R0179 GOPERF1R BLANKS REGISTERS R2 AND R3

```
A0180                                   CAF     0CTXX       CODE FOR CHECKLIST VALUE XX.
A0181                                   TC      BANKCALL
A0182                                   CADR    GOPERF1R
A0183                                   ...     ...         TERMINATE RETURN
A0184                                   ...     ...         PROCEED RETURN
A0185                                   ...     ...         ENTER RETURN
A0186                                   ...     ...         IMMEDIATE RETURN FROM GOPERF1R
```

R0187 GOPERF2R IS THE SAME AS GOPERF2 ONLY AN IMMEDIATE RETURN IS MADE TO USERS CALL CADR +4.

R0189 GOPERF2R DOES NOT BLANK ANY REGISTERS

```
A0190                          CAF     VXXNYY          VARIABLE NOUN YY REQUESTED.  XX=00 OR 01
A0191                          TC      BANKCALL
A0192                          CADR    GOPERF2R
A0193                          ---     ---             TERMINATE RETURN
A0194                          ---     ---             PROCEED RETURN
A0195                          ---     ---             ENTER RETURN
A0196                          ---     ---             IMMEDIATE RETURN HERE FROM GOPERF2R
```

R0197 GOPERF3R IS THE SAME AS GOPERF3 ONLY AN IMMEDIATE RETURN IS MADE TO USERS CALL CADR +4.

R0199 GOPERF3R BLANKS REGISTERS R2 AND R3

```
A0200                          CAF     PROGXX          PERFORM PROGRAM XX
A0201                          TC      BANKCALL
A0202                          CADR    GOPERF3R
A0203                          ---     ---             TERMINATE RETURN
A0204                          ---     ---             PROCEED RETURN
A0205                          ---     ---             ENTER RETURN
A0206                          ---     ---             GOPERF3R IMMEDIATELY RETURNS HERE
```

R0207 GOPERF4R IS THE SAME AS GOPERF4 ONLY AN IMMEDIATE RETURN IS MADE TO USERS CALL CADR +4.

```
A0209                          CAF     OCTXX           REQUEST PERFORM ON OPTIONXX
A0210                          TC      BANKCALL
A0211                          CADR    GOPERF4R
A0212                          ---     ---             TERMINATE RETURN
A0213                          ---     ---             PROCEED RETURN
A0214                          ---     ---             ENTER RETURN
A0215                          ---     ---             IMMEDIATE RETURN TO USER
```

R0216 GOPERF4R BLANKS REGISTER R3

R0217 REPLASHR IS THE SAME AS REPLASH ONLY AN IMMEDIATE RETURN IS MADE TO THE USERS CALL CADR +4.

```
A0219                          CAF     VXXNYY          VXX NYY WILL BE A FLASHING VERB NOUN
A0220                          TC      BANKCALL
A0221                          CADR    REPLASHR
A0222                          ---     ---             TERMINATE RETURN
A0223                          ---     ---             PROCEED RETURN
A0224                          ---     ---             ENTER RETURN
A0225                          ---     ---             IMMEDIATE RETURN TO USER
```

R0226 REGODSPR IS THE SAME AS REGODSP ONLY A RETURN (IMMEDIATE) IS MADE TO THE USER.

```
A0228                          CAF     V30NYY
A0229                          TC      BANKCALL
A0230                          CADR    REGODSPR

A0231                          ...     ...          IMMEDIATE RETURN TO USER
```

P0232 GOMARK IS USED TO DISPLAY A MARK VERB NOUN ARRIVING IN A. NO RETURN IS MADE TO THE USER.

R0234 GOXDSP = GOMARK

```
A0235                                   CAF     VXXNYY          VXXNYY CONTAINS VERB AND NOUN
A0236                                   TC      BANKCALL
A0237                                   CADR    GOMARK          OTHER EXTENDED VERBS USE CADR GOXDSP
```

R0238 GOMARKR IS THE SAME AS GOMARK ONLY RETURN IS TO THE USER.

R0239 GOXDSPR = GOMARKR

```
A0240                                   CAF     VXXNYY
A0241                                   TC      BANKCALL
A0242                                   CADR    GOMARKR         OTHER EXTENDED VERBS USE CADR GOXDSPR
A0243                                   ...     ...             IMMEDIATE RETURN OF GOMARKR
```

R0244 GOMARKF DISPLAYS A FLASHING MARK VERB NOUN WITH NO IMMEDIATE RETURN TO THE USER. 3 RETURNS ARE POSSIBLE FROM
R0246 THE ASTRONAUT (SEE NO. 7 ABOVE).

R0247 GOXDSPF = GOMARKF

```
A0248                                   CAF     VXXNYY          VXXNYY WILL BE A FLASHING MARK VERB NOUN
A0249                                   TC      BANKCALL
A0250                                   CADR    GOMARKF         OTHER EXTENDED VERBS USE CADR GOXDSPF
A0251                                   ...     ...             TERMINATE RETURN
A0252                                   ...     ...             PROCEED RETURN
A0253                                   ...     ...             ENTER OR RECYCLE RETURN
```

R0254 GOMARKFR IS THE SAME AS GOMARKF ONLY AN IMMEDIATE RETURN IS MADE TO THE USER CALL CADR +4.

R0256 GOXDSPFR = GOMARKFR

```
A0257                                   CAF     VXXNYY          FLASHING MARK VERB NOUN
A0258                                   TC      BANKCALL
A0259                                   CADR    GOMARKFR        OTHER EXTENDED VERBS USE CADR GOXDSPFR
A0260                                   ...     ...             TERMINATE RETURN
A0261                                   ...     ...             PROCEED RETURN
A0262                                   ...     ...             ENTER OR RECYCLE RETURN
A0263                                   ...     ...             IMMEDIATE RETURN TO THE USER
```

R0264 GOMARK1 IS USED FOR A PLEASE PERFORM ON A MARK REQUEST WITH ONLY 1 ASTRONAUT RETURN TO THE USER. NO IMMEDIATE
R0266 RETURN IS MADE. THE DESIRED MARK PLEASE PERFORM VERB AND DESIRED NOUN ISENTERED IN A. GOMARK1 DISPLAYS R1, R2, R
R0268 MEANS OF A V05NYY FOLLOWED BY A FLASHING V5XNYY FOR A PLEASE PERFORM. THE ASTRONAUT WILL RESPOND WITH A MARK
R0270 OR MARK REJECT OR AN ENTER. THE ENTER IS THE ONLY ASTRONAUT RESPONSE THAT WILL COME BACK TO THE USER.

```
A0272                                   CAF     V5XNYY          X=1,2,3,4   Y= NOUN
A0273                                   TC      BANKCALL
```

L DISPLAY INTERFACE ROUTINES

```
                                        CADR    GOMARK1
A0274
                                        ...     ...             ENTER RETURN
A0275

R0276   *** IF BLANKING DESIRED ON NON R ROUTINES, NOTIFY DISPLAYER.

R0277   GOMARK1R IS THE SAME AS A GOMARK1 ONLY AN IMMEDIATE RETURN IS MADE TO THE USERS CALL CADR +2.
                                        CAF     V5XNYY          X=1,2,3,4    YY = NOUN
A0279
A0280                                   TC      BANKCALL
A0281                                   CADR    GOMARK1R
                                                                ASTRONAUT ENTER RETURN
A0282                                   ...     ...             IMMEDIATE RETURN TO USER
A0283

R0284   GOMARK2 IS THE SAME AS GOMARK1 ONLY 3 RETURNS ARE MADE TO THE USER FROM THE ASTRONAUT.
                                        CAF     V5XNYY          X=1,2,3,4    YY=NOUN
A0286
A0287                                   TC      BANKCALL
A0288                                   CADR    GOMARK2
                                        ...     ...             TERMINATE RETURN
A0289                                   ...     ...             PROCEED RETURN
A0290                                   ...     ...             ENTER RETURN
A0291
R0292   GOMARK2R IS THE SAME AS GOMARK1R ONLY 3 ASTRONAUT RETURNS ARE MADE TO THE USER.

                                        CAF     V5XNYY          X=0,1,2,3,4    YY=NOUN
A0294
A0295                                   TC      BANKCALL
A0296                                   CADR    GOMARK2R
                                        ...     ...             TERMINATE RETURN
A0297                                   ...     ...             PROCEED RETURN
A0298                                   ...     ...             ENTER RETURN
A0299
                                        ...     ...             IMMEDIATE RETURN TO THE USER
A0300

R0301   GOMARK3 IS USED FOR A PLEASE PERFORM ON A MARK REQUEST WITH A 3 COMP. DEC DISPLAY. THE DESIRED MARK PLEASE
R0303   PERFORM VERB AND NOUN ARE ENTERED IN A. GOMARK3 DISPLAYS R1, R2, R3 BY MEANS OF A V06NYY FOLLOWED BY A FLASHING
R0305   V5XNYY FOR A PLEASE PERFORM. GOMARK3 HAS 3 ASTRONAUT RETURNS TO THE USER WITH NO IMMEDIATE RETURN.

                                        CAF     V5XNYY          X=1, 2,3,4 YY=NOUN
A0307
A0308                                   TC      BANKCALL
A0309                                   CADR    GOMARK3
                                        ...     ...             TERMINATE RETURN
A0310                                   ...     ...             PROCEED RETURN
A0311                                   ...     ...             ENTER RETURN
A0312

R0313   GOMARK4 IS THE SAME AS GOMARK3 ONLY R2 AND R3 ARE BLANKED AND R1 IS DISPLAYED IN OCTAL.

                                        CAF     V5XNYY          X=1,2,3,4 YY=NOUN
A0315
A0316                                   TC      BANKCALL
A0317                                   CADR    GOMARK4
                                        ...     ...             TERMINATE RETURN
A0318                                   ...     ...             PROCEED RETURN
A0319
```

```
A0320                                   ...     ...         ENTER RETURN

R0321  EXDSPRET IS USED TO DISPLAY A VERB NOUN ARRIVING IN A WITH A RETURN MADE TO THE USER AFTER THE DISPLAY HAS BEEN
R0323  SENT OUT.

A0324                                   CAF     VXXNYY
A0325                                   TC      BANKCALL
A0326                                   CADR    EXDSPRET

A0327                                   ...     ...         RETURN TO USER

R0328  KLEENEX CLEANS OUT ALL MARK DISPLAYS (ACTIVE AND INACTIVE). A RETURN IS MADE TO THE USER AFTER THE MARK DISPLAYS
R0330  HAVE BEEN CLEANED OUT.

A0331                                   TC      BANKCALL
A0332                                   CADR    KLEENEX

A0333                                   ...     ...         RETURN TO USER

R0334  MARKBRAN IS A SPECIAL PURPOSE ROUTINE USED FOR SAVING JOB VAC AREAS (SEE DESCRIPTION OF MARKBRAN BELOW).

A0336                                   TC      BANKCALL
A0337                                   CADR    MARKBRAN

A0338                                   ...     ...         BAD RETURN IF MARK DISPLAY NOT ACTIVE

A0339
A0340                                                       (GOOD RETURN TO IMMEDIATE RETURN LOC OF
                                                            LAST FLASHING MARK R ROUTINE)

R0341  PINBRNCH REESTABLISHES THE LAST ACTIVE FLASHING DISPLAY. IF THERE IS NO ACTIVE FLASHING DISPLAY, THE DSKY IS
R0343  BLANKED AND CONTROL IS SENT TO ENDOFJOB.

A0344                                   TC      POSTJUMP
A0345                                   CADR    PINBRNCH

R0346  PRIODSP IS USED AS A PRIORITY DISPLAY.  IT WILL DISPLAY A GOFLASH TYPE DISPLAY WITH THREE POSSIBLE RETURNS FROM
R0348  THE ASTRONAUT(SEE NO.7 ABOVE).

R0349       THE MAIN PURPOSE OF PRIODSP IS TO REPLACE THE PRESENT DISPLAY WITH A DISPLAY OF HIGHER PRIORITY AND TO
R0351  PROVIDE A MEANS FOR RESTORING THE OLD DISPLAY WHEN THE PRIORITY DISPLAY
R0352  IS RESPONDED TO BY THE ASTRONAUT.

R0353       THE FORMER DISPLAY IS RESTORED BY AN AUTOMATIC BRANCH TO WAKE UP THE DISPLAY THAT WAS INTERRUPTED BY THE
R0355  PRIO DISPLAY.

A0356                                   CAF     VXXNYY      VXXNYY WILL BE A FLASHING VERB NOUN
A0357                                   TC      BANKCALL
A0358                                   CADR    PRIODSP
A0359                                   ...     ...         TERMINATE RETURN
A0360                                   ...     ...         PROCEED RETURN
```

```
A0361                                   ...     ...             ENTER OR RECYCLE RETURN

R0362   PRIODSPR IS THE SAME AS PRIODSPONLY AN IMMEDIATE RETURN IS MADE TO THE  USERS CALL CADR +4.

A0364                                   CAF     VXXNYY          VXXNYY WILL BE A FLASHING VERB NOUN
A0365                                   TC      BANKCALL
A0366                                   CADR    PRIODSPR
A0367                                   ...     ...             TERMINATE RETURN
A0368                                   ...     ...             PROCEED RETURN
A0369                                   ...     ...             ENTER OR RECYCLE RETURN

A0370                                   ...     ...             IMMEDIATE RETURN

R0371   PRIOLARM DOES A V05N09 PRIODSPR.
R0372   CLEANDSP CLEANS OUT ALL NORMAL DISPLAYS (ACTIVE AND INACTIVE). A RETURN IS MADE TO THE USER AFTER NORMAL
R0374   DISPLAYS ARE CLEANED OUT.

A0375                                   TC      BANKCALL
A0376                                   CADR    CLEANDSP

A0377                                   ...     ...             RETURN TO USER
```

```
P0378   GENERAL INFORMATION
R0379   ------- -----------
R0380   ALARM OR ABORT EXIT MODES--

A0381                                   PRIOBORT TC     ABORT
A0382                                          OCT      1502

R0383   PRIOBORT IS BRANCED TO WHEN (1)  A NORMAL DISPLAY IS REQUESTED AND  ANOTHER NORMAL DISPLAY IS ALREADY ACTIVE
R0385   (REFLASH AND REGODSP ARE EXCEPTIONS) OR (2) A PRIORITY DISPLAY IS REQUESTED WHEN ANOTHER PRIORITY DISPLAY IS
R0387   ALREADY ACTIVE (A PRIORITY WITH LINUS BIT14 IS AN EXCEPTION).
R0388   ERASABLE INITIALIZATION REQUIRED--

R0389       ACCOMPLISHED BY FRESH START- 1. FLAGWRD4 (USED EXCLUSIVELY BY DISPLAY INTERFACE ROUTINES)
R0391                                    2. NVSAVE = NORMAL VERB AND NOUN       REGISTER.
R0393                                    3. EBANKTEM = NORMAL INACTIVE FLAGWORD(ALSO CONTAINS NORMALS EBANK).
R0395                                    5. R1SAVE = MARKBRAN CONTROL WORD
R0396                                    4. RESTREG = PRIORITY 30 AND SUPERBANK 3.
R0398   OUTPUT--

R0399       NVWORD = PRIO VERB AND NOUN
R0400       NVWORD +1(MARKNV) = MARK VERB AND NOUN
R0401       NVWORD +2(NVSAVE) = NORMAL VERB AND NOUN

R0402       DSPFLG(EBANKSAV) = PRIO FLAGWORD (INCLUDING EBANK)
R0403       DSPFLG +1(MARKEBAN) = MARK FLAGWORD (INCLUDING EBANK)
R0404       DSPFLG +2(EBANKTEM) = NORMAL FLAGWORD (INCLUDIG EBANK)

R0405       CADRFLSH = PRIO USERS CALL CADR +1 LOCATION
R0406       CADRFLSH +1(MARKFLSH) = MARK USERS CALL CADR +1 LOCATION
R0407       CADRFLSH +2(TEMPFLSH) = NORMAL USERS CALL CADR +1 LOCATION

R0408       PRIOTIME = TIME EACH PRIO REQUEST FIRST SENT OUT
R0409       OPTION1 = DESIRED OPTION FROM GOPERF4
R0410       FLAGWRD4 = BIT INFO FOR CONTROL OF ALL DISPLAY ROUTINES
R0411       DSPTEM1 = R1 INFO FOR ASTRONAUT FROM PERFORM DISPLAYS(NORMAL)
R0412   SUBROUTINES USED-- NVSUB, FLAGUP, FLAGDOWN, ENDOFJOB, BLANKSUB, ABORT, JOBWAKE, JOBSLEEP, FINDVAC, PRIOCHNG,
R0414   JAMTERM, NVSUBUSY, FLASHON, ENDIDLE, CHANG1, BANKJUMP, MAKECADR, NOVAC,
R0415   DEBRIS-- (STORED INTO)

R0416       TEMPORARY TEMPORARIES- A, Q, L, MPAC +2, MPAC +3, MPAC +4, MPAC +5, MPAC +6, RUPTREG2, RUPTREG3, CYL,
R0418   EBANK, RUPTREG4, LOC, BANKSET, MODE, MPAC, MPAC +1                    4, FACEREG
R0420       ERASABES(SHARED AND USED WITH OTHER PROGRAMS) CADRSTOR, DSPLIST, LOC, DSPTEM1, OPTION1

R0422       ERASABLES(USED ONLY BY DISPLAY ROUTINES)- NVWORD,+1,+2, DSPFLG,+1,+2, CADRFLSH,+1,+2, PRIOTIME, FLAGWRD4,
```

```
R0424   R1SAVE, MARK2PAC,
R0425   DEBRIS-- (USED BUT NOT STORED INTO)- NOUNREG, VERBREG, LOCCTR, MONSAVE1
R0426   FLAGWORD DESCRIPTIONS--
R0427       FLAGWRD4- SEE DESCRIPTION UNDER LOG SECTION ERASABLE ASSIGNMENTS

R0428       DSPFLG, DSPFLG+1, DSPFLG +2-
R0429       ----------------------------
R0430   BITS 1 BLANK R1
R0431        2 BLANK R2
R0432        3 BLANK R3
R0433        4 FLASHING DISPLAY REQUESTED
R0434        5 PERFORM DISPLAY REQUESTED
R0435        6 -----          EXDSPRET          GODSPRET
R0436        7 PRIO DISPLAY   -----              -----
R0437        8 -----       DEC MARK PERFORM     -----
R0438        9 EBANK
R0439       10 EBANK
R0440       11 EBANK
R0441       12 -----    -----.        V99PASTE
R0442       13 2ND PART OF PERFORM
R0443       15 REFLASH OR REDO -----          REFLASH OR REDO
R0444       15 -----       MARK REQUEST        -----
R0445   RESTARTING DISPLAYS--

R0446   RULES FOR THE DSKY OPERATOR--

R0447       1. PROCEED AND TERMINATE SERVE AS RESPONSES TO REQUESTS FOR OPERATOR RESPONSE (FLASHING V/N).  AS LONG
R0449          AS THERE IS ANY REQUEST AWAITING OPERATOR RESPONSE, ANY USE OF PROCEED OR TERMINATE WILL SERVE AS
R0451          RESPONSES TO THAT REQUEST.  CARE SHOULD BE EXERCISED IN ATTEMPTING TO KILL AN OPERATOR INITIATED MONITOR
R0453          WITH PROCEED AND TERMINATE FOR THIS REASON.
R0454       2. THE ASTRONAUT MUST RESPOND TO A PRIORITY DISPLAY NO SOONER THAN 5 SECS FROM THE TIME THE MISSION
R0456          PROGRAM SENT OUT THE REQUEST FOR OPERATOR RESPONSE (THE ASTRONAUT WOULD SEE THIS DISPLAY FOR LESS TIME
R0458          DUE TO TIME IT TAKES TO GET DISPLAY SENT OUT.)  IF THE ASTRONAUT RESPONDS TOO SOON, THE PRIORITY DISPLAY
R0460          IS SENT OUT AGAIN----AND AGAIN UNTIL AN ACCUMULATED 5 SECS FROM TIME THE FIRST PRIORITY DISPLAY WAS SENT
R0462          OUT.  THE SAME 5 SEC. DELAY WILL OCCUR AT 163.84 SECS OR IN ANY MULTIPLE OF THAT TIME DUE TO PROGRAM
R0464          CONSIDERATION.
R0465       3. KEY RELEASE BUTTON-
R0466          A) IF THE KEY RELEASE LIGHT IS ON, IT SIMPLY RELEASES THE KEYBOARD AND DISPLAY FOR INTERNAL USE.
R0468          B) IF THE KEY RELEASE LIGHT IS OFF, AND IF SOME REQUEST FOR OPERATOR RESPONSE (FLASHING V/N) IS STILL
R0470             AWAITING RESPONSE  THEN IT RE-ESTABLISHES THE DISPLAYS THAT ORIGINALLY REQUESTED RESPONSE.
R0472          IF AN OPERATOR WANTS THEREFORE TO RE-ESTABLISH BUT CONDITION (A) IS ENCOUNTERED, A SECOND DEPRESSION OF
R0474          KEY RELEASE BUTTON MAY BE NECESSARY.
R0475       4. IT IS IMPORTANT TO ANSWER ALL REQUESTS FOR OPERATOR RESPONSE.
R0476       5. IT IS ALWAYS GOOD PRACTICE TO TERMINATE AN EXTENDED VERB BEFORE ASKING FOR ANOTHER ONE OR THE SAME ONE
R0478          OVER AGAIN.
R0479   SPECIAL CONSIDERATIONS--
```

R0480 1. MPAC +2 SAVED ONLY IN MARK DISPLAYS
R0481 2. GODSP(R),REGODSP(R),GOMARK(R) ALWAYS TURN ON THE FLASH IF ENTERED WITH A PASTE VERB REQUEST.
R0483 3. ALL NORMAL DISPLAYS ARE RESTARTABLE EXCEPT GODSP(R), REGODSP(R)
R0484 4. ALL EXTENDED VERBS WITH DISPLAYS SHOULD START WITH A TC TESTXACT AND FINISH WITH A TC ENDEXT.
R0486 5. GODSP(R) AND REGODSP(R) MUST BE IN THE SAME EBANK AND SUPERBANK AS THE LAST NORMAL DISPLAY RESTARTED
R0488 BY A .1 RESTART PHASE CHANGE.
R0489 6. IN ORDER TO SET UP A NON DISPLAY .1 RESTART POINT, THE USER MUST MAKE CERTAIN THAT RESTREG CONTAINS THE
R0491 . CORRECT PRIORITY AND SUPERBANK AND THAT EBANKTEM CONTAINS THE CO
R04911 7. IF CLEANDSP IS RESTARTED VIA A .1 PHASE CHANGE, CAF ZERO SHOULD BE EXECUTED BEFORE THE TC BANKCALL.

L DISPLAY INTERFACE ROUTINES USER'S PAGE NO. 14 E0 S4

```
P0492   CALLING SEQUENCE FOR BLANKING
A0493                                                   CAF    BITX          X=1,2,3 BLANK R1,R2,R3 RESPECTIVELY
A0494                                                   TC     BLANKET
A0495                                                   ...    ...           RETURN TO USER HERE

R0496   IN ORDER TO USE BLANKET CORRECTLY THE USER MUST USE A DISPLAY ROUTINE THAT ENDS IN R FIRST FOLLOWED BY THE CALL
R0498   TO BLANKET AT THE IMMEDIATE RETURN LOC.

 0499                              5415                        BLOCK  02
 0500   REF   1                    4000                        SETLOC FFTAG4
 0501                              5415                        BANK

 0502   REF   1                                                COUNT  02/DSPLA

 0503   REF 702  LAST 1417         5415  54 162 0  BLANKET     TS     MPAC +6
 0504   REF   1                    5416   4 0160 1             CS     PLAYTEM4
 0505   REF 703  LAST 1433         5417   7 0162 0             MASK   MPAC +6
 0506   REF 704  LAST 1433         5420  50 161 1             INDEX  MPAC +5
 0507   REF   2  LAST 1433         5421  26 160 1             ADS    PLAYTEM4

 0508   REF 331  LAST 1419         5422   0 0002 0             TC     Q

 0511   REF  63  LAST 1410         5423   0 4574 0  ENDMARK    TC     POSTJUMP
 0512   REF   1                    5424    20457 0             CADR   MARKEND

 05121  REF 269  LAST 1418         5425   3 4714 1  CLEARMRK   CAF    ZERO
 05122  REF  20  LAST  888         5426  55=044 1             TS     EXTVBACT

 05123                             5427   0 0004 0             INHINT
 05124  REF  81  LAST 1406         5430   4 4712 0             CS     BIT1
 05125  REF   5  LAST  385         5431   7 0100 1             MASK   FLAGWRD4
 05126  REF   6  LAST 1433         5432  54 100 1             TS     FLAGWRD4

 05127                             5433   0 0003 1             RELINT
 05128  REF 332  LAST 1433         5434   0 0002 0             TC     Q
R0513   ***ALL EXTENDED VERB ROUTINES THAT HAVE AT LEAST ONE FLASHING DISPLAY MUST TCF ENDMARK OR TCF ENDEXT WHEN
R0515   FINISHED.

 0516                          10,2457                         BANK   10
 0517   REF   1                10,2000                         SETLOC DISPLAYS
 0518                          10,2457                         BANK

 0519   REF   1                                                COUNT  10/DSPLA

R0520   NTERONLY IS USED TO DIFFERENTIATE THE MARK ROUTINE WITH ONLY ONE RETURN TO THE USER FROM THE MARKING ROUTINE WIT
R0522   3 RETURNS TO THE USER. THIS ROUTINE IS ONLY USED BY GOMARK1 AND GOMARK1R.

 05291  REF   6  LAST  744   10,2457  0 5425 1  MARKEND    TC     CLEARMRK
 05297  REF   1              10,2460  1 3547 0             TCF    MARKOVER
```

```
0530  REP   1                 10,2461  54 155 1  GOMARK    TS   PLAYTEM1    ENTRANCE FOR MARK GODSP

0531  REP  54  LAST 1417      10,2462  3 4674 0  GOMARS    CAP  BIT15       BIT15 SET FOR ALL MARK REQUESTS
0532  REP   1                 10,2463  1 2626 0            TCP  GOFLASH2

0533  REP 270  LAST 1433      10,2464  3 4714 1  KLEENEX   CAP  ZERO        CLEAN OUT EXTENDED VERBS
0534  REP   2  LAST 1434      10,2465  54 155 1  GOMARKP   TS   PLAYTEM1    ENTRANCE FOR MARK GOFLASH

0535  REP   1                 10,2466  3 3157 1            CAP  MARKFMSK    MARK,FLASH
0536  REP   2  LAST 1434      10,2467  1 2626 0            TCP  GOFLASH2

0539  REP   3  LAST 1434      10,2470  54 155 1  GOMARK2   TS   PLAYTEM1    MARK GOPERFS-3 AST. RETURNS
0540  REP   1                 10,2471  3 3646 0  MARKFORM  CAP  MPERFMSK    MARK, PERFORM, FLASH
0541  REP   3  LAST 1434      10,2472  1 2626 0            TCP  GOFLASH2

0542  REP   4  LAST 1434      10,2473  54 155 1  GOMARK3   TS   PLAYTEM1    USED FOR 3COMP DECIMAL PERFORM
0543  REP   1                 10,2474  3 3633 1            CAP  MARK3MSK
0544  REP   4  LAST 1434      10,2475  1 2626 0            TCP  GOFLASH2

0545  REP   5  LAST 1434      10,2476  54 155 1  GOMARK4   TS   PLAYTEM1
0546  REP   1                 10,2477  3 3634 0            CAP  MARK4MSK    MARK,PERFORM,FLASH,BLANK
0547  REP   5  LAST 1434      10,2500  1 2626 0            TCP  GOFLASH2

0548  REP   6  LAST 1434      10,2501  54 155 1  GOMARKR   TS   PLAYTEM1    ENTRANCE FOR MARK GODSPR

0549  REP  55  LAST 1434      10,2502  3 4674 0            CAP  BIT15
0550  REP   1                 10,2503  1 2604 0            TCP  GODSPR2

0551  REP   7  LAST 1434      10,2504  54 155 1  GOMARKFR  TS   PLAYTEM1    ENTRANCE FOR MARK GOFLASHR

0552  REP   2  LAST 1434      10,2505  3 3157 1            CAP  MARKFMSK
0553  REP   1                 10,2506  1 2765 0            TCP  GODSPRS

0559  REP   8  LAST 1434      10,2507  54 155 1  GOMARK2R  TS   PLAYTEM1    MARK GOPERFS-3 AST. RETS+ IMMEDIATE RET.
0560  REP   2  LAST 1434      10,2510  3 3646 0            CAP  MPERFMSK    MARK, PERFORM, FLASH
0561  REP   2  LAST 1434      10,2511  1 2765 0            TCP  GODSPRS

05611 REP   9  LAST 1434      10,2512  54 155 1  GOMARK3R  TS   PLAYTEM1
05612 REP   2  LAST 1434      10,2513  3 3633 1            CAP  MARK3MSK
05613 REP   3  LAST 1434      10,2514  1 2765 0            TCP  GODSPRS

0562  REP 163  LAST 1408      10,2515  3 4712 1  MAKEMARK  CAP  ONE
0563  REP   1                 10,2516  0 3083 1            TC   COPIES

0564  REP   7  LAST 1433      10,2517  3 0100 0            CA   FLAGWRD4    IS NORM OR PRIO BUSY OR WAITING
0565  REP   1                 10,2520  7 3647 0            MASK OCT34300
0566  REP 392  LAST 1419      10,2521  10 000 0            CCS  A
0567  REP   1                 10,2522  1 2560 1            TCP  CHKPRIO

0568  REP   8  LAST 1434      10,2523  3 0100 0            CA   FLAGWRD4    IS MARK SLEEPING DUE TO ASTRO BUSY
```

```
0569  BBF  38  LAST 1411   10,2524  7 4702 1          MASK   BIT9
0570                       10,2525  0 0006 1          EXTEND
0571  BBF   1              10,2526  1 2530 1          BZF    MARKPLAY      NO

0572  BBF 110  LAST 1284   10,2527  1 5112 1          TCF    ENDOFJOB

0594                       10,2530  0 0004 0 MARKPLAY INHINT
0595  BBF  29  LAST 1363   10,2531  4 4715 1          CS     FIVE          RESET MARK OVER NORM, SET MARK
0596  BBF   9  LAST 1434   10,2532  7 0100 1          MASK   FLAGWRD4
05965 BBF 164  LAST 1434   10,2533  6 4712 1          AD     ONE
0597  BBF  10  LAST 1435   10,2534  54 100 1          TS     FLAGWRD4
0598                       10,2535  0 0003 1          RELINT

0599  BBF   1              10,2536  4 1070 0 GOGOMARK CS     MARKFLAG      PERFORM
0600  BBF  45  LAST 1415   10,2537  7 4708 0          MASK   BIT5
0601  BBF 393  LAST 1434   10,2540  10 000 0          CCS    A
0602  BBF   1              10,2541  1 2544 1          TCF    MARKCOP
0603  BBF   1              10,2542  4 0370 1          CS     MARKNV
0604  BBF   2  LAST 1435   10,2543  54 370 1          TS     MARKNV

0605  BBF 165  LAST 1435   10,2544  3 4712 1 MARKCOP  CAF    ONE           MARK INDEX
0606  BBF   1              10,2545  1 2744 0          TCF    PRIOPLAY

0607  BBF   1              10,2546  3 0165 0 COPYTOGO CA     MPAC2SAV
0608  BBF 705  LAST 1433   10,2547  54 158 1          TS     MPAC +2

0609  BBF   1              10,2550  50 164 1 COPYPACS INDEX  COPINDEX
0610  BBF   1              10,2551  3 3657 0          CAF    PRIOCCT
0611  BBF   1              10,2552  54 162 0          TS     GENMASK

0612  BBF   2  LAST 1435   10,2553  50 164 1          INDEX  COPINDEX
0613  BBF   1              10,2554  3 1067 1          CAF    EBANKSAV
0614  BBF   1              10,2555  54 160 1          TS     TEMPOR2       ACTIVE EBANK AND FLAG

0615  BBF  63  LAST 1410   10,2556  54 003 0          TS     EBANK

0616  BBF 333  LAST 1433   10,2557  0 0002 0          TC     Q
```

R0617 PINCHEK CHECKS TO SEE IF THE CURRENT MARK REQUEST IS MADE BY THE ASTRONAUT WHILE INTERRUPTING A GOPLAY DISPLAY
R0619 (A NORMAL OR A PRIO). IF THE ASTRONAUT TRIES TO MARK DURING A PRIO, THE CHECK FAIL LIGHT GOES ON AND THE MARK
R0621 REQUEST IS ENDED. IF HE TRIES TO MARK DURING A NORM, THE MARK IS ALLOWED. IN THIS CASE THE NORM IS PUT TO SLEEP
R0623 UNTIL ALL MARKING IS FINISHED.

R0624 IF THE MARK REQUEST COMES FROM THE PROGRAM DURING A TIME THE ASTRONAUT IS NOT INTERRUPTING A NORMAL OR A
R0626 PRIO, THE MARK REQUEST IS PUT TO SLEEP UNTIL THE +RESENT ACTIVE DISPLAY IS RESPONDED TO BY THE ASTRONAUT.

```
0628  BBF  11  LAST 1435   10,2560  3 0100 0 CHKPRIO  CA     FLAGWRD4      MARK ATTEMPT DURING PRIO
0629  BBF   1              10,2561  7 3402 0          MASK   OCT24100
0630  BBF 394  LAST 1435   10,2562  10 000 0          CCS    A
0631  BBF   1              10,2563  1 3602 1          TCF    MARSLEEP
```

```
 0632   REF  12  LAST 1435   10,2564  4 0100 1            CS     FLAGWRD4
 0633   REF  35  LAST 1418   10,2565  7 4710 1            MASK   BIT3        SET MARK OVER NORM
 0634                        10,2566  0 0004 0            INHINT
 0635   REF  13  LAST 1436   10,2567  26 100 1            ADS    FLAGWRD4

 0636   REF   1              10,2570  1 2662 0            TCF    SETNORM

 0637   REF   3  LAST 1435   10,2571  3 0370 0  MARKPERF  CA     MARKNV
 0638   REF   1              10,2572  7 4160 0            MASK   VERBMASK
 0639   REF   1              10,2573  1 3246 0            TCF    NV50DSP

 0640   REF  10  LAST 1434   10,2574  54 155 1  GODSP     TS     PLAYTEM1

 0641   REF 271  LAST 1434   10,2575  3 4714 1  GODSP2    CAF    ZERO
 0642   REF   6  LAST 1434   10,2576  1 2626 0            TCF    GOFLASH2

 0643   REF  11  LAST 1436   10,2577  54 155 1  GODSPRET  TS     PLAYTEM1     ENTRANCE FOR A GODSP WITH A PASTE

 0644   REF  55  LAST 1406   10,2600  3 4705 1            CAF    BIT8         SET BIT8 TO GO BACK TO USER AFTER NVSUB
 0645   REF   7  LAST 1436   10,2601  1 2626 0            TCF    GOFLASH2

 0646   REF  12  LAST 1436   10,2602  54 155 1  GODSPR    TS     PLAYTEM1

 0647   REF 272  LAST 1436   10,2603  3 4714 1  GODSPR1   CAF    ZERO
 0648   REF   3  LAST 1433   10,2604  54 160 1  GODSPR2   TS     PLAYTEM4

 0649   REF 273  LAST 1436   10,2605  3 4714 1            CAF    ZERO         * DONT MOVE
 0650   REF   1              10,2606  1 2767 1            TCF    GODSPRS1

R0651        CLEANDSP IS USED FOR CLEARING OUT A NORMAL DISPLAY THAT IS PRESENTLY ACTIVE OR A NORMAL DISPLAY THAT IS
R0653   SET UP TO BE STARTED OR RESTARTED.

R0654        NORMALLY THE USER WILL NOT NEED TO USE THIS ROUTINE SINCE A NEW NORMAL DISPLAY AUTOMATICALLY CLEARS OUT AN
R0656   OLD DISPLAY.

R0657        CALLING SEQUENCE FOR CLEANDSP-

A0658                                                   TC     BANKCALL
A0659                                                   CADR   CLEANDSP

 0660   REF 274  LAST 1436   10,2607  3 4714 1  CLEANDSP  CAF    ZERO
 0661   REF  13  LAST 1436   10,2610  54 155 1  REFLASH   TS     PLAYTEM1

 0662   REF   1              10,2611  3 3632 0            CAF    REDOMASK     FLASH AND PERMIT
 0663   REF   8  LAST 1436   10,2612  1 2626 0            TCF    GOFLASH2

 0664   REF  14  LAST 1436   10,2613  54 155 1  REFLASHR  TS     PLAYTEM1

 0665   REF   2  LAST 1436   10,2614  3 3632 0            CAF    REDOMASK     FLASH AND PERMIT
 0666   REF   4  LAST 1434   10,2615  1 2765 0            TCF    GODSPRS
```

```
0667  REF  15  LAST 1436  10,2616  54 155 1  REGODSP  TS    PLAYTEM1

0668  REF  81  LAST 1404  10,2617  3 4675 1            CAF   BIT14
0669  REF   9  LAST 1438  10,2620  1 2626 0            TCF   GOFLASH2

0670  REF  16  LAST 1437  10,2621  54 155 1  REGODSPR TS    PLAYTEM1

0671  REF  82  LAST 1437  10,2622  3 4675 1            CAF   BIT14
0672  REF   2  LAST 1434  10,2623  1 2604 0            TCF   GODSPR2

0673  REF  17  LAST 1437  10,2624  54 155 1  GOFLASH  TS    PLAYTEM1

0674  REF  52  LAST 1418  10,2625  3 4707 0            CAF   BIT4        LEAVE ONLY FLASH BIT SET
0675  REF   4  LAST 1438  10,2626  54 160 1  GOFLASH2 TS    PLAYTEM4

0676  REF   1            10,2627  0 3050 1            TC    SAVELOCS

0677                     10,2630  0 0003 1            RELINT

0678  REF   1            10,2631  1 2674 1            TCF   MAKEPLAY    BRANCH DIRECT WITH NO SEPARATE JOB CALL

0679  REF  18  LAST 1437  10,2632  54 155 1  PRIODSPR TS    PLAYTEM1

0680  REF   1            10,2633  3 3651 0            CAF   BITS7+4
0681  REF   5  LAST 1436  10,2634  1 2765 0            TCF   GODSPRS

0682  REF  19  LAST 1437  10,2635  54 155 1  PRIODSP  TS    PLAYTEM1

0683  REF   2  LAST 1437  10,2636  3 3651 0  SETPRIO  CAF   BITS7+4
0684  REF  10  LAST 1437  10,2637  1 2626 0            TCF   GOFLASH2

0685  REF 275  LAST 1436  10,2640  3 4714 1  MAKEPRIO CAF   ZERO
0686  REF   3  LAST 1435  10,2641  54 164 0            TS    COPINDEX

0687  REF   1            10,2642  0 3522 1            TC    LINUSCHR
0688  REF   1            10,2643  1 2650 1            TCF   HIPRIO      LINUS RETURN
0689  REF  14  LAST 1436  10,2644  3 0100 0            CA    FLAGWRD4
0690  REF   1            10,2645  7 3670 1            MASK  OCT20100    IS PRIO IN ENDIDLE OR BUSY
0691  REF 395  LAST 1435  10,2646  10 000 0           CCS   A
0692  REF   1            10,2647  1 2723 1            TCF   PRIOBORT    YES, ABORT

0693  REF  15  LAST 1437  10,2650  3 0100 0  HIPRIO   CA    FLAGWRD4    MARK ACTIVE
0694  REF   1            10,2651  7 5612 0            MASK  OCT40400
0695                     10,2652  0 0006 1            EXTEND
0696  REF   1            10,2653  1 2656 1            BZF   ASKIFNRM    NO

0697  REF 276  LAST 1437  10,2654  3 4714 1  SETMARK  CAF   ZERO
0698  REF   1            10,2655  1 3122 1            TCF   JOBXCHS

0699  REF  16  LAST 1437  10,2656  3 0100 0  ASKIFNRM CA    FLAGWRD4    NORMAL ACTIVE
```

```
0700   REF   1                10,2657  7 3666 0          MASK   OCT10200     BITS 13+8
0701                          10,2660  0 0006 1          EXTEND
0702   REF   1                10,2661  1 2664 0          BZF    QKTOCOPY     NO

0703   REF 166  LAST 1435      10,2662  3 4712 1 SETNORM  CAF    ONE
0704   REF   2  LAST 1437      10,2663  1 3122 1          TCF    JOBXCHS

0705   REF   1                10,2664  0 3062 0 QKTOCOPY TC     COPYNORM
0706   REF   1                10,2665  0 3333 1          TC     WITCHONE

0707   REF   8  LAST 1407      10,2666  0 5074 1          TC     JOBWAKE

0708   REF   1                10,2667  0 3350 1          TC     XCHTOEND

0709   REF  22  LAST 1384      10,2670  3 0025 0 REDOPRIO CA     TIME1        SAVE TIME PRIODSP SENT OUT
0710   REF   1                10,2671 55=147 0          TS     PRIOTIME

0711   REF 277  LAST 1437      10,2672  3 4714 1 KEEPPRIO CAF    ZERO         START UP PRIO DISPLAY
0712   REF   2  LAST 1435      10,2673  1 2744 0          TCF    PRIOPLAY

0713   REF  28  LAST 1410      10,2674  3 0167 1 MAKEPLAY CA     PRIORITY     SAVE USERS PRIORITY
07131  REF   3  LAST 1410      10,2675  7 7674 1          MASK   PRIO37
07132  REF   1                10,2676 54 163 1          TS     USERPRIO

07133  REF   1                10,2677  3 7670 1          CAF    PRIO33       RAISE PRIORITY FOR FAST JOBS AFTER WAKE
07134  REF  10  LAST  815      10,2700  0 5103 0          TC     PRIOCHNG

07135  REF   5  LAST 1437      10,2701  3 0160 0          CA     PLAYTEM4     IS IT MARK OR PRIO OR NORM
0714   REF   1                10,2702  7 3650 0          MASK   BITS15+7
0715   REF 398  LAST 1437      10,2703 10 000 0          CCS    A
0716   REF   1                10,2704  1 2640 0          TCF    MAKEPRIO     ITS PRIO
0717   REF   1                10,2705  1 2707 1          TCF    IPLEGAL
0718   REF   1                10,2706  1 2515 0          TCF    MAKEMARK     ITS MARK

0719   REF  75  LAST 1408      10,2707  3 4711 1 IPLEGAL  CAF    TWO
0720   REF   4  LAST 1437      10,2710 54 164 0          TS     COPINDEX

0721   REF   2  LAST 1437      10,2711  0 3522 1          TC     LINUSCHR

0722   REF   1                10,2712  1 2725 1          TCF    QKTOPLAY     LINUS RETURN
0723   REF   3  LAST  196      10,2713  4 1071 1          CS     EBANKTEM
0724   REF  53  LAST 1437      10,2714  7 4707 1          MASK   BIT4
0725   REF 397  LAST 1438      10,2715 10 000 0          CCS    A
0726   REF   2  LAST 1438      10,2716  1 2725 1          TCF    QKTOPLAY     NO

0727   REF  17  LAST 1437      10,2717  3 0100 0          CA     FLAGWRD4     WAS NORM ASLEEP
0728   REF   1                10,2720  7 3641 0          MASK   NBUSMASK    ARE ANY NORMS ASLEEP
0729                          10,2721  0 0006 1          EXTEND
0730   REF   3  LAST 1438      10,2722  1 2725 1          BZF    QKTOPLAY     NO
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0731  REP   6  LAST 1410   10,2723  0 5622 1  PRIOBORT TC    POODOO
0732                       10,2724   01502 1            OCT   1502

0733  REP   1              10,2725  0 3064 0  OKTOPLAY TC    COPIES2

0T331 REP   2  LAST 1438   10,2726  3 0163 0            CA    USERPRIO
0T332                      10,2727  0 0006 1            EXTEND
0T333 REP  24  LAST 1378   10,2730  04 007 1            ROR   SUPERBNK
0T334 REP   3  LAST  193   10,2731  54 366 0            TS    RESTREG

0737  REP  18  LAST 1438   10,2732  3 0100 0            CA    FLAGWRD4    PRIO OR MARK GOING
0738  REP   1              10,2733  7 3642 0            MASK  PRIMASK
0739  REP 398  LAST 1438   10,2734  10 000 0            CCS   A
0740  REP   1              10,2735  1 3102 0            TCF   GOSLEEPS    YES

0741                       10,2736  1 2740 1            TCF   +2
0742  REP   2  LAST 1439   10,2737  1 3102 0            TCF   GOSLEEPS    MARK GOING

R0743 COULD PUT NORM BUSY CHECK HERE TO SAVE TIME
0744  REP   2  LAST 1438   10,2740  0 3333 1            TC    WITCHONE    IS IT NVSUB BUSY, ENDIDLE OR NOONE
0745  REP   9  LAST 1438   10,2741  0 5074 1            TC    JOBWAKE

0746  REP   2  LAST 1438   10,2742  0 3350 1            TC    XCHTOEND

0747  REP  76  LAST 1438   10,2743  3 4711 1  PLAYJUM1  CAF   TWO
0748  REP   5  LAST 1438   10,2744  54 164 0  PRIOPLAY TS    COPINDEX

0749  REP   1              10,2745  1 3216 0            TCF   GOPLAY

0750  REP  20  LAST 1437   10,2746  54 155 1  EXDSPRET TS    PLAYTEM1

0751  REP   2  LAST  154   10,2747  3 7703 1            CAF   BIT15+6
0752  REP  11  LAST 1437   10,2750  1 2626 0            TCF   GOFLASH2

0753  REP   2  LAST  715   10,2751  55=045 0  GOPERF1   TS    NORMTEM1    STORE DESIRED CHECKLIST VALUE
0754  REP   1              10,2752  3 3624 1            CAF   V01N25      USED TO DISPLAY CHECKLIST VALUE IN R1

0755  REP  21  LAST 1439   10,2753  54 155 1  GOPERF3  TS    PLAYTEM1

0756  REP   1              10,2754  3 3623 0            CAF   PERFMASK    LEAVE ONLY FLASH, PERFORM, BLANKING
0757  REP  12  LAST 1439   10,2755  1 2626 0            TCF   GOFLASH2

0758  REP  22  LAST 1439   10,2756  54 155 1  GOPERF2   TS    PLAYTEM1    DESIRED VERB-NOUN TO DISPLAY R1,R2,R3

0759  REP   1              10,2757  3 3627 1            CAF   PERF2MSK
0760  REP  13  LAST 1439   10,2760  1 2626 0            TCF   GOFLASH2

0764  REP   1              10,2761  0 3043 0  GOPERF4   TC    PURRS4

0765  REP  14  LAST 1439   10,2762  1 2626 0            TCF   GOFLASH2
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0766  REP  23  LAST 1439   10,2763  54 155 1  GOFLASHR TS     PLAYTEM1

0767  REP  54  LAST 1438   10,2764  3 4707 0            CAF    BIT4        LEAVE ONLY FLASH BIT SET
0768  REP   6  LAST 1438   10,2765  54 160 1  GODSPRS   TS     PLAYTEM4

0769  REP  48  LAST 1403   10,2766  3 6214 0            CAF    THREE

0770                       10,2767  0 0004 0  GODSPRS1  INHINT               IMMEDIATE RETURN IS CALL CADR +4
0771  REP   9  LAST 1407   10,2770  54 072 0            TS     RUPTREG3

0772  REP  29  LAST 1438   10,2771  3 0167 1            CA     PRIORITY    MAKE DISPLAY ONE HIGHER THAN USER
0773  REP   4  LAST 1438   10,2772  7 7674 1            MASK   PRIO37
0774  REP  11  LAST 1187   10,2773  54 063 0            TS     NEWPRIO

07741 REP   7  LAST 1440   10,2774  3 0160 0            CA     PLAYTEM4    IS THIS A FLASHING R DISPLAY
07742 REP  55  LAST 1440   10,2775  7 4707 1            MASK   BIT4
07743 REP 399  LAST 1439   10,2776  10 000 0            CCS    A
07744 REP   1              10,2777  1 3005 0            TCF    VACDSP      YES, MAKE DSPLAY JOB A VAC
07745 REP  12  LAST 1440   10,3000  3 0063 1            CA     NEWPRIO     NO, MAKE DSPLAY JOB A NOVAC
07746 REP  34  LAST 1417   10,3001  0 5027 1            TC     NOVAC
07747 REP   7  LAST  664   ET,1777                      EBANK= WHOCARES
07748 REP   2  LAST 1437   10,3002   02674 0            2CADR  MAKEPLAY
07748                      10,3003   20107 0
07749 REP   1              10,3004  1 3013 1            TCF    BOTHJOBS

0775  REP  35  LAST 1410   10,3005  3 0006 1  VACDSP    CA     BBANK
0776                       10,3006  0 0006 1            EXTEND
0777  REP  25  LAST 1439   10,3007  04 007 1            ROR    SUPERBNK
0778  REP 228  LAST 1415   10,3010  54 001 1            TS     L
0779  REP   1              10,3011  3 3865 1            CAF    MAKEGEN
0780  REP   3  LAST  411   10,3012  0 5053 1            TC     SPVAC

0781  REP   2  LAST 1437   10,3013  0 3050 1  BOTHJOBS  TC     SAVELOCS    COPY TEMPS INTO PERMANENT REGISTERS

0782                       10,3014  0 0006 1            EXTEND              SAVE NVWORD AND USERS MPAC +2
0783  REP 706  LAST 1435   10,3015  3 0156 0            DCA    MPAC +1
0784  REP  25  LAST 1417   10,3016  50 064 0            INDEX  LOCCTR
0785  REP 707  LAST 1440   10,3017  52 156 1            DXCH   MPAC +1

0786                       10,3020  0 0006 1            EXTEND              SAVE USERS CADR, FLAGS AND EBANK
0787  REP 708  LAST 1440   10,3021  3 0160 0            DCA    MPAC +3
0788  REP  26  LAST 1440   10,3022  50 064 0            INDEX  LOCCTR
0789  REP 709  LAST 1440   10,3023  52 160 1            DXCH   MPAC +3

0790  REP  27  LAST 1440   10,3024  3 0064 0            CA     LOCCTR
0791  REP 710  LAST 1440   10,3025  54 161 0            TS     MPAC +5

0792  REP   1              10,3026  0 3055 1            TC     SAVELOCR
0793                       10,3027  0 0003 1            RELINT
```

L DISPLAY INTERFACE ROUTINES

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0794  REF   9  LAST 1372   10,3030  1 4577 1            TCF     BANKJUMP    CALL CADR +4
0795  REF   3  LAST 1439   10,3031  55=045 0  GOPERF1R  TS      NORMTEM1    DESIRED CHECKLIST VALUE
0796  REF   2  LAST 1439   10,3032  3 3624 1            CAF     V01N25      DISPLAYS CHECKLIST VALUE IN R1
0797  REF  24  LAST 1440   10,3033  54 155 1  GOPERFRS  TS      PLAYTEM1
0798  REF   2  LAST 1439   10,3034  3 3623 0            CAF     PERFMASK    LEAVE ONLY FLASH, PERFORM, BLANKING
0799  REF   6  LAST 1437   10,3035  1 2765 0            TCF     GODSPRS
0800  REF  25  LAST 1441   10,3036  54 155 1  GOPERF2R  TS      PLAYTEM1    DESIRED VERB-NOUN TO DISPLAY R1,R2,R3
0801  REF   2  LAST 1439   10,3037  3 3627 1            CAF     PERF2MSK
0802  REF   7  LAST 1441   10,3040  1 2765 0            TCF     GODSPRS
0806  REF   2  LAST 1439   10,3041  0 3043 0  GOPERF4R  TC      PURRS4
0807  REF   8  LAST 1441   10,3042  1 2765 0            TCF     GODSPRS
0808  REF   7  LAST  848   10,3043  55=131 1  PURRS4     TS      OPTION1     DESIRED OPTION CODE
0809  REF   1               10,3044  3 3630 1            CAF     V04N06
0810  REF  26  LAST 1441   10,3045  54 155 1            TS      PLAYTEM1
0811  REF   1               10,3046  3 3631 0            CAF     PERF4MSK    FLASH,PERFORM AND BLANK R3
0812  REF 334  LAST 1435   10,3047  0 0002 0            TC      Q
0813                        10,3050  0 0004 0  SAVELOCS  INHINT
0815  REF   1               10,3051  4 3640 1            CS      OCT3400     EBANK BITS
0816  REF   8  LAST 1440   10,3052  7 0160 1            MASK    PLAYTEM4
0817  REF  64  LAST 1435   10,3053  6 0003 1            AD      EBANK
0818  REF   9  LAST 1441   10,3054  54 160 1            TS      PLAYTEM4
0819  REF 335  LAST 1441   10,3055  22 002 0  SAVELOCR  LXCH    Q
0820  REF   6  LAST 1409   10,3056  0 4604 1            TC      MAKECADR
0821  REF   1               10,3057  54 157 0            TS      PLAYTEM3
0822  REF  10  LAST 1440   10,3060  6 0072 1            AD      RUPTREG3    NOT USED FOR NON R ROUTINES
0823  REF 229  LAST 1440   10,3061  0 0001 0            TC      L
0824  REF 278  LAST 1438   10,3062  3 4714 1  COPYNORM  CAF     ZERO
0825  REF   6  LAST 1439   10,3063  54 164 0  COPIES    TS      COPINDEX
0826                        10,3064  0 0004 0  COPIES2   INHINT
0827  REF  10  LAST 1441   10,3065  3 0160 0            CA      PLAYTEM4    FLAGWORD
0828  REF   7  LAST 1441   10,3066  50 164 1            INDEX   COPINDEX
0829  REF   2  LAST 1435   10,3067  55=067 0            TS      EBANKSAV    EQUIV TO DSPFLG
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0830  REP  1                10,3070  7 3656 0            MASK   CADRMASK     FLASH AND GODSPRET
0831                        10,3071  0 0006 1            EXTEND
0832  REP  1                10,3072  1 3076 1            BZF    SKIPADD

0833  REP  2  LAST 1441     10,3073  3 0157 1            CA     PLAYTEM3
0834  REP  8  LAST 1441     10,3074  50 164 1            INDEX  COPINDEX
0835  REP  3  LAST  173      10,3075  54 372 0            TS     CADRFLSH

0836  REP  27  LAST 1441    10,3076  3 0155 0  SKIPADD   CA     PLAYTEM1     VERB NOUN
0837  REP  9  LAST 1442     10,3077  50 164 1            INDEX  COPINDEX
0838  REP  1                10,3100  54 367 1            TS     NVWORD

0842  REP  1                10,3101  1 3357 1            TCF    RELINTQ

0843  REP  10  LAST 1442    10,3102  50 164 1  GOSLEEPS  INDEX  COPINDEX
0844  REP  2  LAST 1435     10,3103  3 3657 0            CA     PRIOCCT
0845  REP  1                10,3104  7 3106 1            MASK   WAITMASK
0846  REP  1                10,3105  0 7717 1            TC     UPFNT2
0847                        10,3106   03004 0  WAITMASK  OCT    3004
0848  REP  167  LAST 1438    10,3107  4 4712 0            CS     ONE
0849  REP  11  LAST 1442     10,3110  6 0164 1            AD     COPINDEX
0850  REP  1                10,3111  54 154 0            TS     FACEREG

0851  REP  2  LAST 1442      10,3112  50 154 1  XCHSLEEP  INDEX  FACEREG
0852  REP  1                10,3113  3 3636 1            CAF    WAKECADR
0853                        10,3114  0 0004 0            INHINT
0854  REP  10  LAST 1439     10,3115  0 5074 1            TC     JOBWAKE      FIND CADR IN JOB AREA

0855  REP  3  LAST 1439      10,3116  0 3350 1            TC     XCHTOEND     CAUSES AWAKENED JOB TO GO TO ENDOFJOB

0858  REP  3  LAST 1442      10,3117  50 154 1            INDEX  FACEREG      REPLACE SAME CADR BUT NEW JOB AREA
0859  REP  2  LAST 1442      10,3120  3 3636 1            CAF    WAKECADR
0860  REP  7  LAST 1409      10,3121  1 5070 1            TCF    JOBSLEEP

0861  REP  4  LAST 1442      10,3122  54 154 0  JOBXCHS   TS     FACEREG      CONTROLS TYPE OF DISPLAY PUT TO SLEEP
0862  REP  3  LAST 1439      10,3123  0 3333 1            TC     WITCHONE
0863  REP  11  LAST 1442     10,3124  0 5074 1            TC     JOBWAKE
0864  REP  5  LAST 1442      10,3125  3 0154 1            CA     FACEREG
0865  REP  28  LAST 1440     10,3126  50 064 0            INDEX  LOCCTR
0866  REP  6  LAST 1442      10,3127  54 154 0            TS     FACEREG

0867  REP  1                10,3130  3 3143 1            CAF    XCHOADD
0868  REP  1                10,3131  0 3351 0            TC     XCHNYLOC

0869  REP  7  LAST 1442      10,3132  50 154 1            INDEX  FACEREG
0870  REP  1                10,3133.  3 3660 1            CA     MARKOCT
0871  REP  1                10,3134  7 3662 1            MASK   IDLESLEP
0872  REP  1                10,3135  0 7735 1            TC     DOWNENT2
0873                        10,3136   74004 0  IDLEMASK  OCT    74004        * DONT MOVE
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0874   REF   8  LAST 1442   10,3137  50 154 1            INDEX  FACEREG      BIT SHOWS PRIO INTERRUPTED NORM OR MARK
0875   REF  46  LAST 1435   10,3140  3 4706 1            CA     BIT5         BIT5 FOR MARK, BIT4 FOR NORMAL
0876   REF  22  LAST 1401   10,3141  6 4710 0            AD     FOUR
0877   REF   2  LAST 1442   10,3142  0 7717 1            TC     UPENT2       FLAG ROUTINE DOES RELINT
0878   REF   1              10,3143   03112 0  XCHQADD   GENADR XCHSLEEP    * DONT MOVE
0879   REF  19  LAST 1439   10,3144  3 0100 0            CA     FLAGWRD4
0880   REF  36  LAST 1436   10,3145  7 4710 1            MASK   BIT3         IF BIT3 THEN MARK OVER NORM
0881   REF 400  LAST 1440   10,3146  10 000 0            CCS    A
0882   REF   2  LAST 1435   10,3147  0 2530 0  GENMARK   TC     MARKPLAY     USED AS GENADR FOR JOBWAKE
0883   REF   2  LAST 1438   10,3150  1 2664 0            TCF    OKTOCOPY

0884   REF 279  LAST 1441   10,3151  3 4714 1  MARKWAKE  CAF    ZERO
0885   REF   2  LAST 1435   10,3152  54 160 1  WAKEPLAY  TS     TEMPOR2

0886   REF   3  LAST 1443   10,3153  50 160 0            INDEX  TEMPOR2
0887   REF   1              10,3154  3 3652 0            CA     BITS5+11
0888   REF  23  LAST 1443   10,3155  6 4710 0            AD     FOUR
0889   REF   2  LAST 1442   10,3156  0 7735 1            TC     DOWNENT2
0890                        10,3157   40010 1  MARKFMSK  OCT    40010        ***DONT MOVE

0891   REF   4  LAST 1443   10,3160  50 160 0            INDEX  TEMPOR2
0892   REF   3  LAST 1442   10,3161  3 3636 1            CAF    WAKECADR
0893                        10,3162  0 0004 0            INHINT
0894   REF  12  LAST 1442   10,3163  0 5074 1            TC     JOBWAKE

0895   REF   1              10,3164  1 3463 1            TCF    ENDRET

R0896      ALL .1 RESTARTS BRANCH DIRECTLY TO INITDSP. NORMAL DISPLAYS ARE THEONLY DISPLAYS ALLOWED TO USE .1 RESTARTS
R0898   INITDSP FIRST RESTORES THE EBANK AND THE SUPERBANK TO THE MOST RECENT NORMAL EBANK AND SUPERBANK.
R0900      IF THE MOST RECENT NORMAL DISPLAY REQUEST WAS NOT FINISHED, CONTROL IS SENT BACK TO THE LAST NORMAL USER.
R0902   OTHERWISE THE NORMAL DISPLAY SET UP IN THE NORMAL DISPLAY REGS IS STARTED UP IMMEDIATELY.

0904   REF   4  LAST 1438   10,3165  3 1071 0  INITDSP  CA     EBANKTEM     RESTORE MOST RECENT NORMAL EBANK
0905   REF  65  LAST 1441   10,3166  54 003 0            TS     EBANK

0906   REF   4  LAST 1439   10,3167  3 0366 1            CA     RESTREG      SUPERBANK AND JOB PRIORITY
0907   REF   1              10,3170  0 4666 0            TC     SUPERSW      RESTORE SUPERBANK

0908   REF   5  LAST 1440   10,3171  7 7674 1            MASK   PRIO37
0909   REF  11  LAST 1438   10,3172  0 5103 0            TC     PRIOCHNG

0910   REF  49  LAST 1440   10,3173  4 6214 1            CS     THREE
0911   REF   4  LAST  612   10,3174  6 0374 1            AD     TEMPFLSH
0912   REF  10  LAST 1441   10,3175  1 4577 1            TCF    BANKJUMP

0913                        10,3176  0 0003 1  PINBRNCH  RELINT               FOR GOPIN USERS
09135  REF   1              10,3177  3 1072 0            CA     MAR K2PAC     NEEDED TO SAVE MPAC +2 FOR MARK USERS
0914   REF 711  LAST 1440   10,3200  54 156 1            TS     MPAC +2       ONLY

0915   REF  20  LAST 1443   10,3201  3 0100 0            CA     FLAGWRD4      PINBRANCH CONDITION
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0916  REF   1                 10,3202  7 7707 1          MASK  PINMASK
0917  REF 401  LAST 1443      10,3203  10 000 0          CCS   A
0918                          10,3204  1 3207 0          TCF   +3
0919  REF   1                 10,3205  1 3617 0          TCF   ERASER        ** NOTHING IN ENDIDLE
0920  REF   3  LAST 1443      10,3206  1 2530 1          TCF   MARKPLAY

0921  REF  54  LAST 1414      10,3207  0 5435 0  NORMBNCH TC    UPFLAG        SET PINBRANCH BIT
0922  REF   1                 10,3210   00105 0          ADRES PINBRFLG

0923  REF  83  LAST 1437      10,3211  3 4675 1          CAF   BIT14         PRIO INTERRUPTED
0924  REF  21  LAST 1443      10,3212  7 0100 1          MASK  FLAGWRD4
0925  REF 402  LAST 1444      10,3213  10 000 0          CCS   A
0926  REF   1                 10,3214  1 2672 1          TCF   KEEPPRIO

0927  REF   1                 10,3215  1 2743 1          TCF   PLAYJUM1

0928  REF   1                 10,3216  0 2550 0  NVDSP   TC    COPYPACS

09281 REF   5  LAST 1443      10,3217  3 0160 0          CA    TEMPOR2       SET UP BLANK BITS FOR NVMONOPT IN CASE
09282 REF  23  LAST 1410      10,3220  7 4716 1          MASK  SEVEN         USER REQUESTS BLANKING MONITOR
09283 REF 230  LAST 1441      10,3221  54 001 1          TS    L

0929  REF  51  LAST 1411      10,3222  4 4676 0          CS    BIT13
0930  REF  12  LAST 1442      10,3223  50 164 1          INDEX COPINDEX
0931  REF   1                 10,3224  7 1067 0          MASK  DSPFLG
0932  REF  13  LAST 1444      10,3225  50 164 1          INDEX COPINDEX
0933  REF   2  LAST 1444      10,3226  55∝067 0          TS    DSPFLG

0934  REF  32  LAST 1410      10,3227  7 4703 0          MASK  BIT8          BIT8 SET IF DEC MARK PERFORM DISPLAY
0935  REF   5  LAST 1145      10,3230  54 141 1          TS    TEM1

0936  REF 712  LAST 1443      10,3231  3 0156 0          CA    MPAC +2
0937  REF   2  LAST 1435      10,3232  54 165 1          TS    MPAC2SAV

0938  REF   2  LAST 1443      10,3233  55∝072 1          TS    MARK2PAC      * FOR DISK ONLY *
0939  REF  14  LAST 1444      10,3234  50 164 1          INDEX COPINDEX
0940  REF   2  LAST 1442      10,3235  10 367 1          CCS   NVWORD
0941  REF   1                 10,3236  1 3245 0          TCF   NVDSP1
0942  REF   1                 10,3237  1 3361 1          TCF   CLEANEND
0943  REF   4  LAST 1436      10,3240  4 0370 1          CS    MARKNV
0944  REF   5  LAST 1444      10,3241  54 370 1          TS    MARKNV        IN CASE MARKPLAY AWAKENED AFTER SLEEPING
0945  REF  12  LAST 1405      10,3242  7 6043 1          MASK  LOW7
0946  REF   1                 10,3243  6 3643 0          AD    V05N00M1
0947  REF   6  LAST 1444      10,3244  6 0141 0          AD    TEM1
0948  REF 168  LAST 1442      10,3245  6 4712 1  NVDSP1  AD    ONE
0949  REF   1                 10,3246  0 4171 1  NV50DSP TC    NVMONOPT
0950  REF   1                 10,3247  1 3373 1          TCF   REST          IF BUSY
0951  REF   6  LAST  380      10,3250  0 4447 1          TC    FLASHOFF      IN CASE OF EXTENDED VERB NON FLASH

0952  REF   1                 10,3251  0 2546 1          TC    COPYTOGO      MPACS DESTROYED BY NVSUB
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0953  REF  58  LAST 1416   10,3252  0 5447 0          TC      DOWNFLAG    UNSET SLEEPING BITS
0954  REF   1               10,3253   00102 1         ADRES   MRKNVFLG
0541  REF  59  LAST 1445   10,3254  0 5447 0          TC      DOWNFLAG
0542  REF   1               10,3255   00103 0         ADRES   NRMNVFLG
0543  REF  60  LAST 1445   10,3256  0 5447 0          TC      DOWNFLAG
0544  REF   1               10,3257   00104 1         ADRES   PRONVFLG
0955  REF   6  LAST 1444   10,3260  3 0160 0  BLANKCHK CA      TEMPOR2     BLANK BITS 1,2,3 IF SET
0956  REF   2  LAST  351    10,3261  0 4271 1          TC      BLANKSUB
0957  REF   1               10,3262  1 3216 0          TCF     NVDSP
0958  REF  47  LAST 1443   10,3263  3 4706 1  PERFCHEK CAF     BIT5        BIT 5 FOR PERFORM
0959  REF   7  LAST 1445   10,3264  7 0160 1          MASK    TEMPOR2
0960  REF 403  LAST 1444   10,3265  10 000 0          CCS     A           IS THIS A GOPERF DISPLAY
0961  REF   1               10,3266  1 3311 0          TCF     1STOR2ND    YES

0962  REF  56  LAST 1440   10,3267  3 4707 0  GOANIDLE CAF     BIT4
0963  REF   8  LAST 1445   10,3270  7 0160 1          MASK    TEMPOR2
0964  REF 404  LAST 1445   10,3271  10 000 0          CCS     A
0965  REF   1               10,3272  1 3408 1          TCF     FLASHSUB    IT IS

0966  REF   9  LAST 1445   10,3273  4 0160 1          CS      TEMPOR2     IS THIS A GODSPRET
0967  REF  56  LAST 1436   10,3274  7 4705 0          MASK    BIT6
0968  REF 405  LAST 1445   10,3275  10 000 0          CCS     A
0969  REF   1               10,3276  1 3303 0          TCF     ISITN00

09691 REF  15  LAST 1444   10,3277  50 164 1          INDEX   COPINDEX
09692 REF   4  LAST 1442   10,3300  3 0372 1          CA      CADRFLSH
09693 REF 713  LAST 1444   10,3301  54 157 0          TS      MPAC +3
09694 REF   1               10,3302  1 3501 1          TCF     ENDIT

0972  REF  16  LAST 1445   10,3303  50 164 1  ISITN00  INDEX   COPINDEX    IS THIS A PASTE
0973  REF   3  LAST 1444   10,3304  3 0367 0          CA      NVWORD
0974  REF  13  LAST 1444   10,3305  7 6043 1          MASK    LOW7        CHECK MADE FOR PINBRNCH AND PRIO ON MARK
0975                        10,3306  0 0006 1          EXTEND
0976  REF   2  LAST 1445   10,3307  1 3406 1          BZF     FLASHSUB    YES, ASSUME PASTE ALWAYS ON FLASH

0977  REF 111  LAST 1435   10,3310  1 5112 1          TCF     ENDOFJOB    NOT FLASH, NOT GOPERF, THERFORE EXIT

0978  REF  10  LAST 1445   10,3311  3 0160 0  1STOR2ND CA      TEMPOR2
0979  REF  52  LAST 1444   10,3312  7 4676 0          MASK    BIT13
0980  REF 406  LAST 1445   10,3313  10 000 0          CCS     A
0981  REF   1               10,3314  1 3267 0          TCF     GOANIDLE    SECOND

0982  REF  53  LAST 1445   10,3315  3 4676 1          CA      BIT13
0983  REF  17  LAST 1445   10,3316  50 164 1          INDEX   COPINDEX
0984  REF   3  LAST 1444   10,3317  27=067 0          ADS     DSPFLG

09845                       10,3320  22 007 0          ZL
0985                        10,3321  0 0006 1          EXTEND              IS IT MARK
0986  REF   1               10,3322  6 2571 0          BZMF    MARKPERF    YES
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0987   REF  35  LAST 1381   10,3323  7 4677 1            MASK   BIT12
09871                       10,3324  0 0006 1            EXTEND
09872  REF   1               10,3325  1 3331 1            BZF    V50PASTE
09874  REF  20  LAST  678    10,3326  4 1145 1            CS     NVWORD1      NVOWRD1= -0 IS V97. NVWORD1= -400 IS V99
098741 REF   1               10,3327  6 3667 0            AD     V97N00
09875  REF   2  LAST 1436    10,3330  1 3246 0            TCF    NV50DSP
0988   REF   1               10,3331  3 3626 0  V50PASTE  CAF    V50N00
0989   REF   3  LAST 1446    10,3332  1 3246 0            TCF    NV50DSP      DISPLAY SECOND PART OF GOPERF

0990   REF  48  LAST 1445    10,3333  4 4706 0  WITCHONE  CS     BIT5         TURN OFF KEY RELEASE LIGHT
0991                        10,3334  0 0006 1            EXTEND
0992   REF  35  LAST 1418    10,3335  03 011 1            WAND   DSALMOUT

0993   REF  22  LAST 1444    10,3336  3 0100 0            CA     FLAGWRD4
0994   REF   1               10,3337  7 3644 0            MASK   NVBUSMSK     IS IT NVSUB ASLEEP
0995   REF 407  LAST 1445    10,3340  10 000 0            CCS    A
0996   REF 169  LAST 1444    10,3341  3 4712 1            CAF    ONE
0997   REF 231  LAST 1444    10,3342  54 001 1            TS     L
0998   REF 280  LAST 1443    10,3343  3 4714 1            CAF    ZERO
0999   REF 232  LAST 1446    10,3344  50 001 0            INDEX  L
1000   REF  11  LAST  370    10,3345  57=042 0            XCH    CADRSTOR

1001                        10,3346  0 0004 0            INHINT
1002   REF 336  LAST 1441    10,3347  0 0002 0            TC     Q

1003   REF   6  LAST  360    10,3350  3 4233 1  XCHTOEND  CAF    ENDINST      TC ENDOFJOB REPLACES GENADR IN LOC FOR
1004   REF  29  LAST 1442    10,3351  56 064 0  XCHNYLOC  XCH    LOCCTR       WAS THIS ADDRESS SLEEPING
1005                        10,3352  0 0006 1            EXTEND
1006   REF   2  LAST 1442    10,3353  6 3357 0            BZMF   RELINTQ      NO
1007   REF  30  LAST 1446    10,3354  56 064 0            XCH    LOCCTR       YES
1008   REF  31  LAST 1446    10,3355  50 064 0            INDEX  LOCCTR
1009   REF  42  LAST 1407    10,3356  54 164 0            TS     LOC

1010                        10,3357  0 0003 1  RELINTQ   RELINT
1011   REF 337  LAST 1446    10,3360  0 0002 0            TC     Q            BACK TO USER

1012   REF   5  LAST  777    10,3361  3 7667 1  CLEANEND  CAF    PRIO32       ONE LOWER THAN DISPLAYS SLEEPING
1014   REF  33  LAST 1387    10,3362  0 5042 1            TC     FINDVAC
1015   REF   2  LAST  180      0371                      EBANK= NVSAVE
1016   REF   1               10,3363   04245 0           2CADR  JAMTERM
1016   REF   1               10,3364   04100 1

1017   REF   3  LAST 1445    10,3365  1 3407 0            TCF    FLASHSUB +1

1018   REF  23  LAST 1446    10,3366  3 0100 0  ISITPRIO  CA     FLAGWRD4
1019   REF   1               10,3367  7 3414 1            MASK   ITISMASK     IS PINBRFLG, MARKIDFLG SET
1020                        10,3370  0 0006 1            EXTEND
1021   REF   2  LAST 1437    10,3371  1 2723 1            BZF    PRIOBORT
1022   REF 112  LAST 1445    10,3372  1 5112 1            TCF    ENDOFJOB
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1023  REF  12  LAST 1446   10,3373  11=042 1  REST       CCS   CADRSTOR    IS SOMEONE IN ENDIDLE
1024  REF 113  LAST 1446   10,3374  1 5112 1             TCF   ENDOPJOB    YES
1025  REF   1              10,3375  1 3377 0             TCF   RESTSLEP

1026  REF 114  LAST 1447   10,3376  1 5112 1             TCF   ENDOPJOB

1027  REF   2  LAST 1435   10,3377  3 0162 1  RESTSLEP   CA    GENMASK     SET NVSLEEP BITS
1028  REF   1              10,3400  7 3645 1             MASK  ASTROMSK
1029  REF   3  LAST 1443   10,3401  0 7717 1             TC    UPENT2
1030                       10,3402   24100 0  OCT24100   OCT   24100       *** DONT MOVE

1031  REF  18  LAST 1445   10,3403  50 164 1             INDEX COPINDEX
1032  REF   1              10,3404  3 3635 1             CAF   NVCADR
1033  REF   2  LAST  376   10,3405  0 4456 1             TC    NVSUBUSY    BUSY OR ABORT IF ILLEGAL

1034  REF   4  LAST  359   10,3406  0 4443 0  FLASHSUB   TC    FLASHON

1035  REF  19  LAST 1447   10,3407  3 0164 1             CA    COPINDEX    COPINDEX DESTROYED BY ENDIDLE
1036  REF   1              10,3410  54 157 0             TS    COPMPAC

1037  REF   3  LAST 1447   10,3411  3 0162 1             CA    GENMASK
1038  REF   1              10,3412  7 3136 1             MASK  IDLEMASK
1039  REF   4  LAST 1447   10,3413  0 7717 1             TC    UPENT2
1040                       10,3414   40040 1  ITISMASK   OCT   40040       *** ENDIDLE ALLOW *** DONT MOVE

1041  REF   2  LAST  188   10,3415  3 1073 1             CA    R1SAVE      IS THIS A REPEAT AND RETURN DISPLAY
1042  REF  20  LAST 1447   10,3416  50 164 1             INDEX COPINDEX
1043  REF  37  LAST 1443   10,3417  7 4710 1             MASK  BIT3
1044  REF 408  LAST 1446   10,3420  10 000 0             CCS   A
1045  REF   1              10,3421  1 3506 0             TCF   UNSETR1     YES

1046  REF  13  LAST 1447   10,3422  11=042 1             CCS   CADRSTOR    SEE IF SOMEONE ALREADY IN ENDIDLE
1047  REF   1              10,3423  1 3366 0             TCF   ISITPRIO
1048                       10,3424  1 3426 0             TCF   +2
1049  REF   2  LAST 1447   10,3425  1 3366 0             TCF   ISITPRIO

1050  REF   1              10,3426  0 4223 0             TC    ENDIDLE
1051  REF   1              10,3427  1 3520 1  IDLERET1   TCF   TERMATE

1052  REF   1              10,3430  1 3537 1             TCF   PROCEED     ENDIDLE RETURNS HERE ON PROCEED

1053  REF   1              10,3431  4 3654 1             CS    LOWLOAD
1054  REF 714  LAST 1445   10,3432  6 0154 1             AD    MPAC        VERBREG
1055                       10,3433  0 0006 1             EXTEND
1056  REF 409  LAST 1447   10,3434  26 000 0             DIM   A
1057                       10,3435  0 0006 1             EXTEND
1058  REF   1              10,3436  1 3607 1             BZF   LOADITIS    V21 OR V22 OR V23 ON DSKY
1059  REF  77  LAST 1439   10,3437  3 4711 1  OKTOENT    CAF   TWO
1060  REF   1              10,3440  54 161 0  ENDOUT     TS    OUTHERE
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1061  REF  24  LAST 1446   10,3441  3 0100 0            CA    FLAGWRD4     CHECK NATURE OF ENDIDLE RETURN
1062  REF  15  LAST 1379   10,3442  7 4105 0            MASK  OCT80000
1063  REF 410  LAST 1447   10,3443  10 000 0            CCS   A
1064  REF   1              10,3444  1 3447 1            TCF   TIMECHEK     PRIO ENDIDLE RETURN
1065  REF   1              10,3445  1 3555 0            TCF   NORMRET      NORMAL ENDIDLE RETURN
1066  REF   1              10,3446  1 3541 0            TCF   MARKRET      MARK ENDIDLE RETURN

1067  REF  23  LAST 1438   10,3447  4 0025 1  TIMECHEK  CS    TIME1
1068  REF   2  LAST 1438   10,3450  6 1147 1            AD    PRIOTIME
1069  REF 411  LAST 1448   10,3451  10 000 0            CCS   A
1070                       10,3452  4 0000 0            COM
1071  REF   5  LAST 1384   10,3453  6 7700 1            AD    OCT37776
1072  REF 170  LAST 1446   10,3454  6 4712 1            AD    ONE
1073  REF   1              10,3455  6 3677 1            AD    -2SEC
1074                       10,3456  0 0006 1            EXTEND
1075  REF   2  LAST 1444   10,3457  6 2672 0            BZMF  KEEPPRIO

1076  REF   2  LAST 1448   10,3460  1 3555 0            TCF   NORMRET

1084  REF 171  LAST 1448   10,3461  3 4712 1  NORMWAKE  CAF   ONE
1085  REF   1              10,3462  1 3152 0            TCF   WAKEPLAY

1086  REF   2  LAST 1447   10,3463  10 161 0  ENDRET    CCS   OUTHERE
1087  REF 172  LAST 1448   10,3464  6 4712 1            AD    ONE
1088                       10,3465  1 3467 0            TCF   +2          NORMAL ENDIDLE EXIT
1089  REF 115  LAST 1447   10,3466  1 5112 1            TCF   ENDOFJOB
1090  REF   2  LAST 1447   10,3467  50 157 1            INDEX COPMPAC
1091  REF   5  LAST 1445   10,3470  6 0372 1            AD    CADRFLSH
1092  REF 715  LAST 1447   10,3471  54 157 0            TS    MPAC +3

1093  REF   4  LAST 1447   10,3472  3 0162 1            CA    GENMASK      REMOVE ENDIDLE AND PINBRANCH BITS
1094  REF   1              10,3473  7 3475 0            MASK  PINIDMSK
1095  REF   3  LAST 1443   10,3474  0 7735 1            TC    DOWNENT2
1096                       10,3475   74044 1  PINIDMSK  OCT   74044       *** DONT MOVE

1097  REF  50  LAST 1443   10,3476  4 6214 1            CS    THREE        BLANK EVERYTHING EXCEPT MM
1098  REF   2  LAST  231   10,3477  0 4170 0            TC    NVSUB
1099                       10,3500  1 3501 1            TCF   +1

1100  REF   3  LAST 1439   10,3501  3 0163 0  ENDIT     CA    USERPRIO     RETURN TO USERS PRIORITY
1101  REF   6  LAST 1443   10,3502  7 7674 1            MASK  PRIO37
1102  REF  12  LAST 1443   10,3503  0 5103 0            TC    PRIOCHNG
1103  REF 716  LAST 1448   10,3504  3 0157 1            CA    MPAC +3
1104  REF  11  LAST 1443   10,3505  1 4577 1            TCF   BANKJUMP

1105  REF  21  LAST 1447   10,3506  50 164 1  UNSETR1   INDEX COPINDEX     RESET REPEAT AND RETURN REQUEST
1106  REF  38  LAST 1447   10,3507  4 4710 1            CS    BIT3
1107  REF   3  LAST 1447   10,3510  7 1073 0            MASK  R1SAVE
1108  REF   4  LAST 1448   10,3511  55=073 0            TS    R1SAVE
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1109  REF 281  LAST 1446   10,3512  3 4714 1          CAF   ZERO       *** 205 ONLY MARKBRAN USERS IN
1110  REF   2  LAST 1443   10,3513  0 4666 0          TC    SUPERSW    SUPERBANK 0

1111  REF  51  LAST 1448   10,3514  3 6214 0  -1      CAF   THREE      RETURN TO USERS IMMEDIATE RETURN LOC
1112  REF  22  LAST 1448   10,3515  50 164 1  IMMEDRET INDEX COPINDEX
1113  REF   6  LAST 1448   10,3516  6 0372 1          AD    CADRFLSH
1114  REF  12  LAST 1448   10,3517  1 4577 1          TCF   BANKJUMP

1115  REF 282  LAST 1449   10,3520  3 4714 1  TERMATE CAF   ZERO       ASTRONAUT TERMINATE (V34) RETURNS TO
1116  REF   1               10,3521  1 3440 0          TCF   ENDOUT

1117  REF  11  LAST 1441   10,3522  4 0160 1  LINUSCHR CS    PLAYTEM4   IS THIS A LINUS
1118  REF  84  LAST 1444   10,3523  7 4675 0          MASK  BIT14
1119  REF 412  LAST 1448   10,3524  10 000 0          CCS   A
1120  REF   4  LAST 1372   10,3525  1 6706 1          TCF   Q+1        NO
1121  REF   3  LAST 1442   10,3526  4 0157 0          CS    PLAYTEM3   YES, IS IT ALREADY IN ENDIDLE
1122  REF  23  LAST 1449   10,3527  50 164 1          INDEX COPINDEX
1123  REF   7  LAST 1449   10,3530  6 0372 1          AD    CADRFLSH
1124                       10,3531  0 0006 1          EXTEND
1125                       10,3532  1 3534 1          BZF   +2         YES

1126  REF 338  LAST 1446   10,3533  0 0002 0          TC    Q          NO
1127  REF  12  LAST  381   10,3534  11-012 1          CCS   DSPLOCK    IS THE ASTRONAUT BUSY
1128  REF 116  LAST 1448   10,3535  0 5112 0          TC    ENDOPJOB   END THE NEW DISPLAY, ITS ALREADY ACTIVE
1129  REF 339  LAST 1449   10,3536  0 0002 0          TC    Q

R1130 MORE LOGIC COULD BE INCORPORATED HERE TO MAKE SURE A RECYCLE IS A RECYCLAND CONVERSLY THAT A LOAD IS A LOAD.
1132  REF 173  LAST 1448   10,3537  3 4712 1  PROCEED CAF   ONE        ASTRONAUT PROCEED (V33) RETURNS
1133  REF   2  LAST 1449   10,3540  1 3440 0          TCF   ENDOUT

R1138      LASTPLAY CHECKS TO SEE IF (1) THE LAST NORMAL DISPLAY WAS EITHER INTERRUPTED BY A PRIO OR A MARK (MARK
R1140 COULD ONLY HAPPEN DURING PINBRANCH) OR IF (2) THE LAST NORMAL DISPLAY WAS REQUESTED WHILE A HIGHER PRIORITY
R1142 DISPLAY WAS GOING RESULTING IN THE NORMAL BEING PUT TO SLEEP.

R1143      IF EITHER OF THE ABOVE 2 CONDITIONS EXISTS , THE NORMAL DISPLAY IS AWAKENED TO GO TO PLAYJUM1 WHICH STARTS
R1145 UP THE MOST RECENT VALID NORMAL DISPLAY. IF THESE 2 CONDITIONS DO NOT EXIST, CONTROL GOES TO PLAYJUM1 WHICH IS
R1147 STARTED IMMEDIATELY WITH THE ASSUMPTION THAT THE MOST RECENT NORMAL DISPLAY IS ALREADY IN-ENDIDLE(DURING A
R1149 PINBRANCH) OR THAT A RESTART HAS OCCURRED AND THE DISPLAY CAN BE STARTED AS A .1 RESTART.

1163  REF  42  LAST 1391   10,3541  4 6211 1  MARKRET CS    SIX
1164  REF  25  LAST 1448   10,3542  7 0100 1          MASK  FLAGWRD4
1165                       10,3543  0 0004 0          INHINT
1166  REF  26  LAST 1449   10,3544  54 100 1          TS    FLAGWRD4   *** MAY MOVE DISPLAY FLAGWORD OUT OF
1167                       10,3545  0 0003 1          RELINT             INHINT REALM
1168  REF   2  LAST 1443   10,3546  1 3463 1          TCF   ENDRET

1169  REF   2  LAST 1402   10,3547  3 7716 0  MARKOVER CAF   MINUS1     RUPTREG2 IS - MEANS ENDOPJOB TO ENDRET
1170  REF   3  LAST 1448   10,3550  54 161 0          TS    OUTHERE
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1171  REP  27  LAST 1449   10,3551  3 0100 0          CA    FLAGWRD4    IS ENDIDFLG SET
1172  REP  15  LAST 1372   10,3552  7 4371 1          MASK  PRIO30      IS NORMAL OR PRIO IN ENDIDLE
1173  REP 413  LAST 1449   10,3553  10 000 0          CCS   A
1174  REP   1              10,3554  1 3207 0          TCF   NORMBNCH

1175  REP  28  LAST 1450   10,3555  3 0100 0 NORMRET  CA    FLAGWRD4    IS MARK SLEEPING
1176  REP   2  LAST 1443   10,3556  7 3652 1          MASK  BITS5+11    OR WAITING
1177  REP 414  LAST 1450   10,3557  10 000 0          CCS   A
1178  REP   1              10,3560  1 3151 0          TCF   MARKWAKE

1179  REP  29  LAST 1450   10,3561  3 0100 0          CA    FLAGWRD4    NO
1180  REP   1              10,3562  7 3653 0          MASK  BITS4+10    IS NORMAL INTERRUPTED OR WAITING
1181  REP 415  LAST 1450   10,3563  10 000 0          CCS   A
1182  REP   1              10,3564  1 3461 0          TCF   NORMWAKE    YES

1183  REP   5  LAST 1443   10,3565  3 1071 0          CA    EBANKTEM    NO, WAS IT A FLASH REQUEST
1184  REP   6  LAST 1410   10,3566  7 4726 1          MASK  OCT50       OR A GODSPRET
1185  REP 416  LAST 1450   10,3567  10 000 0          CCS   A
1186  REP   3  LAST 1449   10,3570  1 3463 1          TCF   ENDRET      YES
1187  REP   3  LAST 1446   10,3571  3 0371 1          CA    NVSAVE
1188                       10,3572  0 0006 1          EXTEND
1189  REP   4  LAST 1450   10,3573  1 3463 1          BZF   ENDRET

1190  REP   4  LAST  648   10,3574  3 4762 0          CAF   PRIO15
1191                       10,3575  0 0004 0          INHINT
1192  REP  35  LAST 1440   10,3576  0 5027 1          TC    NOVAC
1193  REP   4  LAST 1445      0367                    EBANK= NVWORD
1194  REP   2  LAST 1444   10,3577   02743 0          2CADR PLAYJUM1
1194                       10,3600   20100 1

1195  REP   5  LAST 1450   10,3601  1 3463 1          TCF   ENDRET

1196  REP  30  LAST 1450   10,3602  3 0100 0 MARSLEEP CA    FLAGWRD4    IS MARK ALREADY IN
1197  REP   3  LAST 1450   10,3603  7 3652 1          MASK  BITS5+11
1198  REP 417  LAST 1450   10,3604  10 000 0          CCS   A
1199  REP 117  LAST 1449   10,3605  1 5112 1          TCF   ENDOFJOB    YES
11991 REP   3  LAST 1439   10,3606  1 3102 0          TCF   GOSLEEPS

1200  REP   3  LAST 1448   10,3607  50 157 1 LOADITIS INDEX COPMPAC
1201  REP   5  LAST 1450   10,3610  3 0367 0          CA    NVWORD
1202  REP  14  LAST 1445   10,3611  7 6043 1          MASK  LOW7
1203                       10,3612  4 0000 0          COM
1204  REP 717  LAST 1448   10,3613  6 0155 0          AD    MPAC +1     NOUNREG
1205                       10,3614  0 0006 1          EXTEND
1206  REP   1              10,3615  1 3437 0          BZF   OKTOENT     NO, THEN LOAD IS VALID
1207  REP   6  LAST  447   10,3616  1 3176 0          TCF   PINBRNCH    YES, ACCEPT LOAD BUT ASK FOR LAST AGAIN

1208  REP  52  LAST 1449   10,3617  4 6214 1 ERASER   CS    THREE       BLANK EVERYTHINGEXCEPT MM
1209  REP   3  LAST 1448   10,3620  0 4170 0          TC    NVSUB
1210  REP 118  LAST 1450   10,3621  1 5112 1          TCF   ENDOFJOB
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1211   REF 119  LAST 1450   10,3622  1 5112 1          TCF    ENDOFJOB

1212                        10,3623  00036  1  PERFMASK OCT    0036        FLASH,PERFORM,BLANK R2 AND R3
1213                        10,3624  00231  1  V01N25   VN     00125
1214                        10,3625  01407  0  V06N07   VN     00607       GOPERF3 VN DISPLAY BEFORE V50
1215                        10,3626  14400  0  V50N00   VN     5000
1216                        10,3627  00030  1  PERF2MSK OCT    00030       FLASH, PERFORM
1217                        10,3630  01006  0  V04N06   VN     00406
1218                        10,3631  00014  1  PERF4MSK OCT    14          FLASH, BLANK R3
1219   REF   7  LAST 1450   10,3176           GOAGIN   EQUALS PINBRNCH
1220                        10,3632  20010  1  REDOMASK OCT    20010       BITS 4 AND 14
1221                        10,3633  40230  1  MARK3MSK OCT    40230       MARK,DECIMAL NOUN, PERFORM,FLASH
1222                        10,3634  40036  0  MARK4MSK OCT    40036       MARK,PERFORM,FLASH,BLANK 2 AND 3
1223   REF   1              10,3635  20670  1  NVCADR   CADR   REDOPRIO
1224   REF   4  LAST 1444   10,3636  20530  0  WAKECADR CADR   MARKPLAY
1225   REF   3  LAST 1450   10,3637  20743  0           CADR   PLAYJUM1

1226                        10,3640  03400  0  OCT3400  OCT    3400        EBANK MASK
1227                        10,3641  11210  1  NBUSMASK OCT    11210
1228                        10,3642  66521  1  PMMASK   OCT    66521
1229   REF   4  LAST  358      4160           VERBMASK =      MID7        (OCT 37600)
1230                        10,3643  01177  1  V05N00M1 OCT    1177        V05 MINUS ONE
1231   REF   1              10,2461           GOXDSP   EQUALS GOMARK
1232   REF   1              10,2501           GOXDSPR  EQUALS GOMARKR
1233   REF   9  LAST  891   10,2465           GOXDSPF  EQUALS GOMARKF
1234   REF   5  LAST  891   10,2504           GOXDSPFR EQUALS GOMARKFR
1235   REF   4  LAST  563      5423           ENDEXT   EQUALS ENDMARK
1236   REF  14  LAST 1186      0165           MPAC2SAV EQUALS BANKSET
1238                        10,3644  00700  0  NVBUSMSK OCT    700
12385                       10,3645  00704  1  ASTROMSK OCT    704
1239                        10,3646  40030  0  MPERFMSK OCT    40030       BIT 15,5,4 FOR MARK,PERFORM,FLASH
1240                        10,3647  34300  0  OCT34300 OCT    34300
1241                        10,3650  40100  1  BITS15+7 OCT    40100
1242                        10,3651  00110  1  BITS7+4  OCT    110
1243   REF   3  LAST 1441      1067           DSPFLG   EQUALS EBANKSAV
1244   REF   1                  1070           MARKFLAG EQUALS MARKEBAN
1245   REF   6  LAST 1450      1071           SAVEFLAG EQUALS EBANKTEM
1246                        10,3652  02020  1  BITS5+11 OCT    2020        * DONT MOVE
1247                        10,3653  01010  1  BITS4+10 OCT     1010       * DONT MOVE
1249                        10,3654  00026  0  LOWLOAD  DEC    22
1250                        10,3655  77730  0  BUSYMASK OCT    77730
1252                        10,3656  00050  1  CADRMASK OCT    50
1253   REF   7  LAST 1393      7707           PINMASK  EQUALS 13,14,15
1254   REF   2  LAST 1445   10,3216           GOPLAY   EQUALS NVDSP
A1255                                         PRIOSAVE EQUALS R1SAVE
1256   REF 718  LAST 1450      0157           COPMPAC  EQUALS MPAC +3
1257   REF 719  LAST 1451      0160           TEMPOR2  EQUALS MPAC +4
1258   REF 720  LAST 1451      0161           OUTHERE  EQUALS MPAC +5
1259   REF  43  LAST 1446      0164           COPINDEX EQUALS LOC
1260   REF  26  LAST 1152      0163           USERPRIO EQUALS MODE
```

```
1261   REF 721  LAST 1451      0162             GENMASK  EQUALS MPAC +6
1262                         10,3657   20144 1   PRIOOCT  OCT    20144        PRIO
1263                         10,3660   42424 0   MARKOCT  OCT    42424        MARK
1264                         10,3661   11254 1             OCT    11254        NORM

1265                         10,3662   74704 1   IDLESLEP OCT    74704
1266                         10,3663   67777 1   OCT67777 OCT    67777
1267   REF  18  LAST  891      5415             LINUS    EQUALS BLANKET
1268   REF 722  LAST 1452      0154             FACEREG  EQUALS MPAC
1269   REF 723  LAST 1452      0155             PLAYTEM1 EQUALS MPAC +1
1270   REF 724  LAST 1452      0157             PLAYTEM3 EQUALS MPAC +3
1271   REF 725  LAST 1452      0160             PLAYTEM4 EQUALS MPAC +4
1273                         10,3664   40420 0   OCT40420 OCT    40420
1274   REF   3  LAST 1440   10,3665   02674 0   MAKEGEN  GENADR MAKEPLAY
1275                         10,3666   10200 1   OCT10200 OCT    10200
1276                         10,3667   30200 0   V97N00   VN     09700        PASTE FOR V97 OR V99
12761                        10,3670   20100 1   OCT20100 OCT    20100
```

```
0037                                7717                    BLOCK   3
0038   REF   1                     6000                    SETLOC  FFTAG6
0039                                7717                    BANK
0040   REF   1                                              COUNT   03/FLAG

0043   REF 233  LAST 1446          7717  54 001 1  UPENT2   TS      L       WHICH FLAGWORD IS IT
0044   REF   4  LAST 1382          7720  7 4716 1          MASK    OCT7
0045   REF 234  LAST 1453          7721  56 001 0          XCH     L       SAVE IN L FOR INDEXING

0046   REF   3  LAST 1364          7722  7 5630 0          MASK    OCT77770  OBTAIN THE BIT INFORMATION
0047                               7723  0 0004 0          INHINT          PREVENT INTERUPTS
0048   REF  30  LAST 1404          7724  54 061 1          TS      ITEMP1    STORE THE BIT INFORMATION TEMPORARIALY

0049   REF 235  LAST 1453          7725  50 001 0          NDX     L
0050   REF  12  LAST  993          7726  4 0074 0          CS      FLAGWRD0
0051   REF  31  LAST 1453          7727  7 0061 1          MASK    ITEMP1
0052   REF 236  LAST 1453          7730  50 001 0          NDX     L
0053   REF  13  LAST 1453          7731  26 074 0          ADS     FLAGWRD0
0054                               7732  0 0003 1          RELINT          RELEASE INTERUPT INHIBIT

0055   REF 340  LAST 1449          7733  24 002 0          INCR    Q       OBTAIN THE CORRECT RETURN ADDRESS
0056   REF 341  LAST 1453          7734  0 0002 0          TC      Q       RETURN

0059   REF 237  LAST 1453          7735  54 001 1  DOWNENT2 TS      L       WHICH FLAGWORD IS IT
0060   REF   5  LAST 1453          7736  7 4716 1          MASK    OCT7
0061   REF 238  LAST 1453          7737  56 001 0          XCH     L       SAVE IN L FOR INDEXING

0062   REF   4  LAST 1453          7740  7 5630 0          MASK    OCT77770  OBTAIN THE BIT INFORMATION
0063                               7741  4 0000 0          COM             START TO PROCESS THE INFORMATION

0064                               7742  0 0004 0          INHINT          PREVENT INTERUPTS
0065   REF 239  LAST 1453          7743  50 001 0          NDX     L
0066   REF  14  LAST 1453          7744  7 0074 0          MASK    FLAGWRD0
0067   REF 240  LAST 1453          7745  50 001 0          NDX     L
0068   REF  15  LAST 1453          7746  54 074 0          TS      FLAGWRD0
0069                               7747  0 0003 1          RELINT          RELEASE INTERUPT INHIBIT

0070   REF 342  LAST 1453          7750  24 002 0          INCR    Q       OBTAIN THE CORRECT RETURN ADDRESS
0071   REF 343  LAST 1453          7751  0 0002 0          TC      Q       RETURN

0072   REF  24  LAST 1444           4716          OCT7      EQUALS  SEVEN
0073                              10,3671                   BANK    10
```

```
P0074
R0075       UPFLAG AND DOWNFLAG ARE ENTIRELY GENERAL FLAG SETTING AND CLEARING SUBROUTINES.  USING THEM, WHETHER OR
R0077   NOT IN INTERRUPT, ONE MAY SET OR CLEAR ANY SINGLE, NAMED BIT IN ANY ERASABLE REGISTER, SUBJECT OF COURSE TO
R0079   EBANK SETTING.  A "NAMED" BIT, AS THE WORD IS USED HERE, IS ANY BIT WITH A NAME FORMALLY ASSIGNED BY THE YUL
R0081   ASSEMBLER.

R0082       AT PRESENT THE ONLY NAMED BITS ARE THOSE IN THE FLAGWORDS.  ASSEMBLER CHANGES WILL MAKE IT POSSIBLE TO
R0084   NAME ANY BIT IN ERASABLE MEMORY.

R0085       CALLING SEQUENCES ARE AS FOLLOWS'-

R0086                       TC      UPFLAG                  TC      DOWNFLAG
R0087                       ADRES   NAME OF FLAG            ADRES   NAME OF FLAG

R0088       RETURN IS TO THE LOCATION FOLLOWING THE "ADRES" ABOUT .58 MS AFTER THE "TC".

R0090       UPON RETURN A CONTAINS THE CURRENT FLAGWRD SETTING.

 0091                           5435                        BLOCK   02
 0092   REP   5  LAST 1381     4000                        SETLOC  FFTAG1
 0093                           5435                        BANK
 0094   REP   1                                            COUNT*  $$/FLAG

 0095   REP 344  LAST 1453     5435  3 0002 0  UPFLAG      CA      Q
 0096   REP   1                5436  0 5453 0              TC      DEBIT
 0097                          5437  4 0000 0              COM                     +(15 - BIT)
 0098                          5440  0 0006 1              EXTEND
 0099   REP  16  LAST 1101     5441  04 001 1              ROR     LCHAN           SET BIT
 0100   REP  32  LAST 1453     5442  50 061 0  COMFLAG     INDEX   ITEMP1
 0101   REP  16  LAST 1453     5443  54 074 0              TS      FLAGWRD0
 0102   REP   5  LAST 1379     5444  22 063 1              LXCH    ITEMP3
 0103                          5445  0 0003 1              RELINT
 0104   REP 241  LAST 1453     5446  0 0001 0              TC      L
 0105   REP 345  LAST 1454     5447  3 0002 0  DOWNFLAG    CA      Q
 0106   REP   2  LAST 1454     5450  0 5453 0              TC      DEBIT
 0107   REP 242  LAST 1454     5451  7 0001 1              MASK    L               RESET BIT
 0108   REP   1                5452  1 5442 1              TCF     COMFLAG
 0109   REP 174  LAST 1449     5453  6 4712 1  DEBIT      AD      ONE             GET DE BITS
 0110                          5454  0 0004 0              INHINT
 0111   REP   6  LAST 1454     5455  54 063 0              TS      ITEMP3
 0112   REP   4  LAST 1167     5456  3 4721 1              CA      LOW4            DEC15
 0113   REP  33  LAST 1454     5457  54 061 1              TS      ITEMP1
 0114   REP   7  LAST 1454     5460  50 063 1              INDEX   ITEMP3
 0115                          5461  2=7777 0              CA      0 -1            ADRES
 0116   REP 243  LAST 1454     5462  54 001 1              TS      L
 0117   REP 283  LAST 1449     5463  3 4714 1              CA      ZERO
```

```
0118                                5464  0 0006 1      EXTEND
0119  REP  34  LAST 1454           5465  10 061 1      DV      ITEMP1
0120  REP  35  LAST 1455           5466  52 062 1      DXCH    ITEMP1
0121  REP  36  LAST 1455           5467  50 061 0      INDEX   ITEMP1
0122  REP  17  LAST 1454           5470  3 0074 1      CA      FLAGWRD0
0123  REP 244  LAST 1454           5471  54 001 1      TS      L
0124  REP  22  LAST 1403           5472  50 062 0      INDEX   ITEMP2
0125  REP  56  LAST 1434           5473  4 4674 1      CS      BIT15
0126  REP 346  LAST 1454           5474  0 0002 0      TC      Q
```

A = FLAGWRD, L = (15 - BIT)

CURRENT STATE

-(15 - BIT)

```
P0127   DELAYJOB- A GENERAL ROUTINE TO DELAY A JOB A SPECIFIC AMOUNT OF TIME BEFORE PICKING UP AGAIN.

R0129   ENTRANCE REQUIREMENTS...
A0130                                                   CAF     DT              DELAY JOB FOR DT CENTISECS
A0131                                                   TC      BANKCALL
A0132                                                   CADR    DELAYJOB

 0133                       06,3651                     BANK    06
 0134   REF   1             00,2000                     SETLOC  DLAYJOB
 0135                       00,3732                     BANK

B0136   THIS MUST REMAIN IN BANK 0 ****************************************
 0137   REF   1                                         COUNT   00/DELAY

 0138                       00,3732  0 0004 0  DELAYJOB INHINT
 0139   REF 347  LAST 1455  00,3733  54 002 1           TS      Q               STORE DELAY DT IN Q FOR DLY -1 IN

 0140   REF   1             00,3734  3 6214 0           CAF     DELAYNUM        WAITLIST
 0141   REF  37  LAST 1405  00,3735  54 070 1  DELLOOP  TS      RUPTREG1
 0142   REF 418  LAST 1450  00,3736  50 000 1           INDEX   A
 0143   REF   5  LAST  188  00,3737  3 1141 1           CA      DELAYLOC        IS THIS DELAYLOC AVAILABLE
 0144                       00,3740  0 0006 1           EXTEND
 0145   REF   1             00,3741  1 3746 0           BZF     OK2DELAY        YES

 0146   REF  38  LAST 1456  00,3742  10 070 1           CCS     RUPTREG1        NO, TRY NEXT DELAYLOC
 0147   REF   1             00,3743  1 3735 1           TCF     DELLOOP

 0148   REF   7  LAST 1199  00,3744  0 5604 0           TC      BAILOUT         NO AVAILABLE LOCS AVAILABLE.
 0149                       00,3745   01104 0           CCT     1104

 0150   REF   1             00,3746  3 3766 0  OK2DELAY CA      TCSLEEP         SET WAITLIST IMMEDIATE RETURN
 0151   REF   5  LAST 1193  00,3747  54 061 1           TS      WAITEXIT

 0152   REF  30  LAST 1180  00,3750  3 0004 0           CA      FBANK
 0153   REF  39  LAST 1456  00,3751  6 0070 0           AD      RUPTREG1        STORE BBANK FOR TASK CALL
 0154   REF 245  LAST 1455  00,3752  54 001 1           TS      L

 0155   REF   1             00,3753  3 3767 1           CAF     WAKECAD         STORE CADR FOR TASK CALL
 0156   REF   2  LAST 1193  00,3754  1 5148 0           TCF     DLY2 -1         DLY IS IN WAITLIST ROUTINE

 0157   REF   7  LAST 1441  00,3755  0 4604 1  TCGETCAD TC      MAKECADR        GET CALLERS FCADR

 0158   REF  40  LAST 1456  00,3756  50 070 0           INDEX   RUPTREG1
 0159   REF   6  LAST 1456  00,3757  55∝141 0           TS      DELAYLOC        SAVE DELAY CADRS

 0160   REF   8  LAST 1442  00,3760  0 5070 0           TC      JOBSLEEP

 0161   REF 284  LAST 1454  00,3761  3 4714 1  WAKER    CAF     ZERO
 0162   REF  36  LAST 1440  00,3762  50 006 1           INDEX   BBANK
 0163   REF   7  LAST 1456  00,3763  57∝141 1           XCH     DELAYLOC        MAKE DELAYLOC AVAILABLE
```

```
0164   REF  13  LAST 1443   00,3764  0 5074 1            TC      JOBWAKE

0165   REF  73  LAST 1407   00,3765  0 5213 1            TC      TASKOVER

0166   REF   1              00,3766   03753 0  TCSLEEP   GENADR  TCGETCAD -2
0167   REF   1              00,3767   03761 1  WAKECAD   GENADR  WAKER
```

```
P0169   GENTRAN, A BLOCK TRANSFER ROUTINE.

R0170   WRITTEN BY D. EYLES
R0171   MOD 1 BY KERNAN                                        UTILITYM REV 17 11/18/67

R01722  MOD 2 BY SCHULENBERG  (REMOVE RELINT)   SKIPPER REV 4 2/28/68

R0173           THIS ROUTINE IS USEFULL FOR TRANSFERING N CONSECUTIVE ERASABLE OR FIXED QUANTITIES TO SOME OTHER N
R0175   CONSECUTIVE ERASABLE LOCATIONS.  IF BOTH BLOCKS OF DATA ARE IN SWITCHABLE EBANKS, THEY MUST BE IN THE SAME ONE.

R0177           GENTRAN IS CALLABLE IN A JOB AS WELL AS A RUPT.  THE CALLING SEQUENCE IS'

A0179                                   I       CA      N-1             ∫ OF QUANTITIES MINUS ONE.
A0180                                   I +1    TC      GENTRAN         IN FIXED-FIXED.
A0181                                   I +2    ADRES   L               STARTING ADRES OF DATA TO BE MOVED.
A0182                                   I +3    ADRES   M               STARTING ADRES OF DUPLICATION BLOCK.
A0183                                   I +4                            RETURNS HERE.

R0184           GENTRAN TAKES 25 MCT=S (300 MICROSECONDS) PER ITEM + 5 MCT=S (60 MICS) FOR ENTERING AND EXITING.

R0186           A, L AND ITEMP1 ARE NOT PRESERVED.

 0187                           5475                    BLOCK   02
 0188   REP   2  LAST 1433     4000                    SETLOC  FFTAG4
 0189                           5475                    BANK

 0190   REP  37  LAST 1455     0061                    EBANK=  ITEMP1

 0191   REP   1                                        COUNT*  $$/TRAN

 0192                           5475  0 0004 0  GENTRAN  INHINT
 0193   REP  38  LAST 1458     5476  54 061 1          TS      ITEMP1          SAVE N-1.
 0194   REP 348  LAST 1456     5477  50 002 0          INDEX   Q               C(Q) = ADRES L.
 0195                          5500  6 0000 1          AD      0               ADRES (L + N - 1).
 0196   REP 419  LAST 1456     5501  50 000 1          INDEX   A
 0197                          5502  3 0000 1          CA      0               C(ABOVE).
 0198   REP 246  LAST 1456     5503  54 001 1          TS      L               SAVE DATA.
 0199   REP  39  LAST 1458     5504  3 0061 0          CA      ITEMP1
 0200   REP 349  LAST 1458     5505  50 002 0          INDEX   Q
 0201                          5506  6 0001 0          AD      1               ADRES (M + N - 1).
 0202   REP 420  LAST 1458     5507  50 000 1          INDEX   A
 0203                          5510  22 000 1          LXCH    0               STUFF IT.
 0204   REP  40  LAST 1458     5511  10 061 1          CCS     ITEMP1          LOOP UNTIL N-1 = 0.
 0205   REP  13  LAST  785     5512  1 5476 0          TCF     GENTRAN +1
 0207   REP   4  LAST 1372     5513  1 6710 0          TCF     Q+2             RETURN TO CALLER.
```

L SERVICE ROUTINES

P0208 B5OFF ZERO BIT 5 OF EXTVBACT, WHICH IS SET BY TESTXACT.

R0209 MAY BE USED AS NEEDED BY ANY EXTENDED VERB WHICH HAS DONE TESTXACT

0211 . REP 1 COUNT* $$/EXTVB

0212	REP 49	LAST 1446	5514	4 4706 0	B5OFF	CS	BIT5
0213	REP 21	LAST 1433	5515	7 1044 1		MASK	EXTVBACT
0214	REP 22	LAST 1459	5516	55=044 1		TS	EXTVBACT
0215	REP 120	LAST 1451	5517	0 5112 0		TC	ENDOFJOB

```
P0216   SUBROUTINES TO TURN OFF AND TURN ON TRACKER FAIL LIGHT.
 0217                                5520  0 0004 0  TRFAILOF INHINT
 0218   REF   1                     5521  4 7704 1           CS     OCT40200        TURN OFF TRACKER LIGHT
 0219   REF  46  LAST 1396          5522  7 1036 1           MASK   DSPTAB +11D
 0220   REF  57  LAST 1455          5523  6 4674 0           AD     BIT15
 0221   REF  47  LAST 1460          5524  55=036 1           TS     DSPTAB +11D
02215   REF  37  LAST  381          5525  4 1331 0           CS     OPTMODES        TO INSURE THAT CCDU FAIL WILL GO ON
02216   REF  55  LAST 1378          5526  7 4704 1           MASK   BIT7            AGAIN IF IT WAS ON IN ADDITION TO
02217   REF  38  LAST 1460          5527  27=331 0           ADS    OPTMODES        TRACKER FAIL.

 0222                                5530  0 0003 1  REQ      RELINT
 0223   REF 350  LAST 1458          5531  0 0002 0           TC     Q

 0224                                5532  0 0004 0  TRFAILON INHINT
 0225   REF  48  LAST 1460          5533  4 1036 1           CS     DSPTAB +11D     TURN ON
 0226   REF   2  LAST 1460          5534  7 7704 1           MASK   OCT40200
 0227   REF  49  LAST 1460          5535  27=036 1           ADS    DSPTAB +11D
 0228   REF   1                     5536  1 5530 0           TCF    REQ
```

L ALARM AND ABORT

R0001 R0003 THE FOLLOWING SUBROUTINE MAY BE CALLED TO DISPLAY A NON-ABORTIVE ALARM CONDITION. IT MAY BE CALLED EITHER IN INTERRUPT OR UNDER EXECUTIVE CONTROL.

R0004 CALLING SEQUENCE IS AS FOLLOWS'

R0005 TC ALARM
R0006 OCT AAANN ALARM NO. NN IN GENERAL AREA AAA.
R0007 (RETURNS HERE)

```
0008                          5537                    BLOCK  02
0009  REP   1                 4000                    SETLOC FFTAG7
0010                          5537                    BANK

0011  REP   8  LAST  382      0375                    EBANK= FAILREG

0012  REP   1                                         COUNT  02/ALARM
```

R0013 ALARM TURNS ON THE PROGRAM ALARM LIGHT, BUT DOES NOT DISPLAY.

```
0014                          5537  0 0004 0  ALARM     INHINT

0015  REP 351  LAST 1460      5540  3 0002 0            CA     Q
0016  REP   4  LAST 1364      5541  55=363 1  ALARM2    TS     ALMCADR
0017  REP 352  LAST 1461      5542  50 002 0            INDEX  Q
0018                          5543  3 0000 1            CA     0
0019  REP 247  LAST 1458      5544  54 001 1  BORTENT   TS     L

0020  REP  37  LAST 1456      5545  3 0006 1  PRIOENT   CA     BBANK
00202                         5546  0 0006 1    +1      EXTEND
00204 REP  26  LAST 1440      5547  04 007 1            ROR    SUPERBNK     ADD SUPER BITS.
0021  REP   5  LAST 1461      5550  55=364 0            TS     ALMCADR +1

0022  REP 353  LAST 1461      5551  3 0002 0  LARMENT   CA     Q            STORE RETURN FOR ALARM
0023  REP  41  LAST 1458      5552  54 061 1            TS     ITEMP1

0024  REP   9  LAST 1461      5553  10 375 1  CHKFAIL1  CCS    FAILREG      IS ANYTHING IN FAILREG
0025  REP   1                 5554  1 5557 1            TCF    CHKFAIL2     YES TRY NEXT REG
0026  REP  10  LAST 1461      5555  22 375 0            LXCH   FAILREG
0027  REP   1                 5556  1 5571 0            TCF    PROGLARM     TURN ALARM LIGHT ON FOR FIRST ALARM

0028  REP  11  LAST 1461      5557  10 376 1  CHKFAIL2  CCS    FAILREG +1
0029  REP   1                 5560  1 5563 0            TCF    FAIL3
0030  REP  12  LAST 1461      5561  22 376 0            LXCH   FAILREG +1
0031  REP   1                 5562  1 5574 0            TCF    MULTEXIT

0032  REP  13  LAST 1461      5563  3 0377 1  FAIL3     CA     FAILREG +2
0033  REP  37  LAST 1201      5564  7 4672 1            MASK   POSMAX
0034  REP 421  LAST 1458      5565  10 000 0            CCS    A
0035  REP   1                 5566  1 5600 0            TCF    MULTFAIL
0036  REP  14  LAST 1461      5567  22 377 1            LXCH   FAILREG +2
```

```
0037  REP  2  LAST 1461   5570  1 5574 0          TCF   MULTEXIT

0038  REP 50  LAST 1460   5571  4 1036 1  PROGLARM CS    DSPTAB +11D
0039  REP  2  LAST 1437   5572  7 5612 0          MASK  OCT40400
0040  REP 51  LAST 1462   5573  27-036 1          ADS   DSPTAB +11D

0041  REP 42  LAST 1461   5574  56 061 0  MULTEXIT XCH   ITEMP1        OBTAIN RETURN ADDRESS IN A
0042                      5575  0 0003 1          RELINT
0043  REP 422 LAST 1461   5576  50 000 1          INDEX A
0044                      5577  0 0001 0          TC    1

0045  REP 248 LAST 1461   5600  3 0001 0  MULTFAIL CA    L
0046  REP 58  LAST 1460   5601  6 4674 0          AD    BIT15
0047  REP 15  LAST 1461   5602  54 377 0          TS    FAILREG +2

0048  REP  3  LAST 1462   5603  1 5574 0          TCF   MULTEXIT

R0049  PRIOLARM DISPLAYS V05N09 VIA PRIODSPR WITH 3 RETURNS TO THE USER FROM THE ASTRONAUT AT CALL LOC +1,+2,+3 AND
R0051  AN IMMEDIATE RETURN TO THE USER AT CALL LOC +4. EXAMPLE FOLLOWS,
A0052                                             CAF   OCTXX         ALARM CODE
A0053                                             TC    BANKCALL
A0054                                             CADR  PRIOLARM

A0055                                             ...   ...
A0056                                             ...   ...
A0057                                             ...   ...           ASTRONAUT RETURN
A0058                                             TC    PHASCHNG      IMMEDIATE RETURN TO USER. RESTART
A0059                                             OCT   X.1           PHASE CHANGE FOR PRIO DISPLAY

0060                      10,3671                 BANK  10
0061  REP  2  LAST 1433  10,2000                 SETLOC DISPLAYS
0062                      10,3671                 BANK

0063  REP  2 LAST 1433 TO 1453'  650  650*       COUNT 10/DSPLA

0064                      10,3671  0 0004 0  PRIOLARM INHINT          *** KEEP IN DISPLAY ROUTINES BANK
0065  REP 249 LAST 1462   10,3672  54 001 1          TS    L           SAVE ALARM CODE

0066  REP 24  LAST 1410   10,3673  3 0133 0          CA    BUF2        2 CADR OF PRIOLARM USER
0067  REP  6  LAST 1461   10,3674  55-383 1          TS    ALMCADR
0068  REP 25  LAST 1462   10,3675  3 0134 1          CA    BUF2 +1
0069  REP  1              10,3676  0 5546 0          TC    PRIOENT +1  * LEAVE L ALONE
0071                      10,3677   77467 1  -2SEC    DEC   -200        *** DONT MOVE
0072  REP  5  LAST  759   10,3700  3 4743 0          CAF   V05N09
0073  REP  1              10,3701  1 2632 0          TCF   PRIODSPR

0074                        5604                    BLOCK 02
0075  REP  2  LAST 1461     4000                    SETLOC FFTAG7
0076                        5604                    BANK
```

L ALARM AND ABORT

```
0077   REP   2 LAST 1461 TO 1462'     37     37*          COUNT  02/ALARM

0078                                 5604   0 0004 0  BAILOUT  INHINT
0079   REP 354  LAST 1461            5605   3 0002 0           CA     Q
0080   REP   7  LAST 1462            5606   55=363 1           TS     ALMCADR

0081   REP 355  LAST 1463            5607   50 002 0           INDEX  Q
0082                                 5610   3 0000 1           CAF    0
0083   REP   1                      5611   0 5544 1           TC     BORTENT
0084                                 5612    40400 1  OCT40400 OCT    40400

00845                                5613   0 0004 0           INHINT
0085   REP  78  LAST 1447            5614   3 4711 1  WHIMPER  CA     TWO
00851  REP  17  LAST 1372            5615   6 0005 1           AD     Z
00852  REP   1                      5616   54 017 0           TS     BRUPT
00853                                5617   5 0017 1           RESUME
00854  REP  64  LAST 1433            5620   0 4574 0           TC     POSTJUMP      RESUME SENDS CONTROL HERE
00855  REP   3  LAST  254            5621    12641 1           CADR   ENEMA
008552                               5622   0 0004 0  POODOO   INHINT
008553 REP 356  LAST 1463            5623   3 0002 0           CA     Q
008554 REP   8  LAST 1463            5624   55=363 1  ABORT2   TS     ALMCADR
008555 REP 357  LAST 1463            5625   50 002 0           INDEX  Q
008556                               5626   3 0000 1           CAF    0
008557 REP   2  LAST 1463            5627   0 5544 1           TC     BORTENT
008558                               5630    77770 1  OCT77770 OCT    77770         DONT MOVE
00856  REP   1                      5631   3 4705 1           CA     V37FLBIT      IS AVERAGE G ON
008561 REP  24  LAST 1418            5632   7 0103 1           MASK   FLAGWRD7
008562 REP 423  LAST 1462            5633   10 000 0           CCS    A
008563 REP   1                      5634   0 5613 0           TC     WHIMPER -1    YES.  DONT DO POODOO.  DO BAILOUT.

00857  REP 248  LAST 1414            5635   0 4555 0           TC     BANKCALL
00858  REP   2  LAST  180            5636    12474 0           CADR   MR.KLEAN
00859  REP   2  LAST 1463            5637   0 5614 1           TC     WHIMPER

0086                                 5640   0 0004 0  CCSHOLE  INHINT
0087   REP 358  LAST 1463            5641   3 0002 0           CA     Q
0089   REP   1                      5642   0 5624 1           TC     ABORT2
0090                                 5643    01103 1  OCT1103  OCT    1103
0091                                 5644   0 0004 0  CURTAINS INHINT
0092   REP 359  LAST 1463            5645   3 0002 0           CA     Q
0094   REP   2  LAST 1384            5646   0 5541 1           TC     ALARM2
0095                                 5647    00217 0  OCT217   OCT    00217
0096   REP   9  LAST 1463            5650   0 1363 0           TC     ALMCADR       RETURN TO USER

0099   REP 121  LAST 1459             5112                    DOALARM  EQUALS ENDOFJOB
R0100  CALLING SEQUENCE FOR VARALARM

A0101                                                         CAF    (ALARM)
A0102                                                         TC     VARALARM
```

L ALARM AND ABORT USER=S PAGE NO. 4 E0 S4

```
R0103   VARALARM TURNS ON PROGRAM ALARM LIGHT BUT DOES NOT DISPLAY
 0104                          5651  0 0004 0  VARALARM INHINT

 0105   REF 250  LAST 1462     5652  54 001 1          TS      L          SAVE USERS ALARM CODE

 0106   REF 360  LAST 1463     5653  3 0002 0          CA      Q          SAVE USERS Q
 0107   REF  10  LAST 1463     5654  55=383 1          TS      ALMCADR

 0108   REF   2  LAST 1462     5655  0 5545 0          TC      PRIOENT
 0109                          5656   00014 1  OCT14    OCT     14         DONT MOVE

 0110   REF  11  LAST 1464     5657  0 1363 0          TC      ALMCADR    RETURN TO USER

 0111   REF   8  LAST 1456     5604                ABORT   EQUALS BAILOUT  *** TEMPORARY UNTIL ABORT CALLS OUT
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L       UPDATE PROGRAM

R0001   PROGRAM NAME'   P27
R0002   WRITTEN BY'     KILROY/ DE WOLF

R0003   MOD NO'         6
R0004   MOD BY'         KILROY
R0005   DATE'           01DEC67

R0006   LOG SECTION'    UPDATE PROGRAM.

R0007   FUNCT. DESCR'   P27 (THE UPDATE PROGRAM) PROCESSES COMMANDS AND DATA
R0008                     INSERTIONS REQUESTED BY THE GROUND VIA UPLINK.
R0009                     THE P27 PROGRAM WILL ACCEPT UPDATES
R0010                     ONLY DURING P00 FOR THE LM, AND ONLY DURING P00,
R0011                   P02, AND FRESH START FOR THE CSM

R0012   CALLING SEQ'    PROGRAM IS INITIATED BY UPLINK ENTRY OF VERBS 70, 71, 72 AND 73.

R0014   SUBROUTINES'    TESTXACT, NEWMODEX, NEWMODEX +3, GOXDSPP, BANKCALL, FINDVAC, INTPRET, INTSTALL, TPAGREE,
R0016                   INTWAKEU, ENDEXT, POSTJUMP, FALTON, NEWPHASE, PHASCHNG

R0017   NORMAL EXIT'    TC ENDEXT

R0018   ALARM/ABORT'    TC FALTON FOLLOWED BY TC ENDEXT

R0019   RESTARTS'       P27 IS RESTART PROTECTED IN TWO WAYS...
R0020                   1. PRIOR TO VERIFLAG INVERSION(WHICH IS CAUSED BY THE GROUND/ASTRONAUT=S VERIFICATION OF UPDATE
R0022                      DATA BY SENDING A V33E WHEN V21N02 IS FLASHING)---
R0023                      NO PROTECTION EXCEPT PRE-P27 MODE IS RESTORED, COAST + ALIGN DOWNLIST IS SELECTED AND UPLINK
R0025                      ACTIVITY LIGHT IS TURNED OFF.(JUST AS IF A V34E WAS SENT DURING P27 DATA LOADS).
R0027                      V70,V71,V72 OR V73 WILL HAVE TO BE COMPLETELY RESENT BY USER.
R0029                   2. AFTER VERIFLAG INVERSION(WHEN UPDATE OF THE SPECIFIED ERASABLES IS BEING PERFORMED)---
R0031                      PROTECTED AGAINST RESTARTS.

R0032   DEBRIS'        UPBUFF   (20D)  TEMP STORAGE FOR ADDRESSES AND CONTENTS.
R0033                   UPVERB   (1)    VERB NUMBER MINUS 70D (E.G. FOR V72, UPVERB = 72D - 70D = 2)
R0035                   UPOLDMOD (1)    FOR MAJOR MODE INTERRUPTED BY P27.
R0036                   COMPNUMB (1)    TOTAL NUMBER OF COMPONENTS TO BE TRANSMITTED.
R0038                   UPCOUNT  (1)    ACTUAL NUMBER OF COMPONENTS RECEIVED.
R0039                   UPTEMP   (1)    SCRATCH, BUT USUALLY CONTAINS COMPONENT NUMBER TO BE CHANGED DURING VERIFY CYCLE
R0041   INPUT'

R0042    ENTRY'           DESCRIPTION

R0043   V70EXXXXXEXXXXXE (LIFTOFF TIME INCREMENT) DOUBLE PRECISION OCTAL TIME INCREMENT, XXXXX XXXXX,
R0045                    IS ADDED TO TEPHEM, SUBTRACTED FROM AGC CLOCK(TIME2,TIME1), SUBTRACTED FROM CSM STATE
R0047                    VECTOR TIME(TETCSM) AND SUBTRACTED FROM LEM STATE VECTOR TIME(TETLEM).
R0049                    THE DP OCTAL TIME INCREMENT IS SCALED AT 2(28).
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L UPDATE PROGRAM USER«S PAGE NO. 2 E0 84

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R0050   V71E11EAAAAE     (CONTIGUOUS BLOCK UPDATE) II-2 OCTAL COMPONENTS,XXXXX,
R0051   XXXXXE           ARE LOADED INTO ERASABLE STARTING AT ECADR, AAAA.
R0052  XXXXXE            IT IS .GE. 3 .AND. .LE. 20D.,
R0053                    AND (AAAA + II - 3) DOES NOT PRODUCE AN ADDRESS IN THE
R0054   9 NEXT BANK
R0055     .              SCALING IS SAME AS INTERNAL REGISTERS.

R0056   V72E11E          (SCATTER UPDATE) (II-1)/2 OCTAL COMPONENTS,XXXXX, ARE
R0057   AAAAEXXXXXE      LOADED INTO ERASABLE LOCATIONS, AAAA.
R0058   AAAAEXXXXXE      II IS .GE. 3 .AND. .LE. 19D, AND MUST BE ODD.
R0060     .              SCALING IS SAME AS INTERNAL REGISTERS.

R0061   V73EXXXXXEXXXXXE (OCTAL CLOCK INCREMENT) DOUBLE PRECISION OCTAL TIME
R0062                    INCREMENT XXXXX XXXXX, IS ADDED TO THE AGC CLOCK, IN
R0063                    CENTISECONDS SCALED AT (2)28.
R0064                    THIS LOAD IS THE OCTAL EQUIVALENT OF V55.
R0065  OUTPUT'           IN ADDITION TO THE ABOVE REGISTER LOADS, ALL UPDATES
R0066                    COMPLEMENT BIT3 OF FLAGWORD7.
R0067  ADDITIONAL NOTES' VERB 71, JUST DEFINED ABOVE WILL BE USED TO PERFORM BUT NOT LIMITED TO THE FOLLOWING UPDATES--

R0069                    1. CSM/LM STATE VECTOR UPDATE
R0072                    2. REFSMMAT UPDATE
R0073             THE FOLLOWING COMMENTS DELINEATE EACH SPECIAL UPDATE----

R0074   1. CSM/LM STATE VECTOR UPDATE(ALL DATA ENTRIES IN OCTAL)

R0075   ENTRIES'         DATA DEFINITION'                                    SCALE FACTORS'
R0077   V71E             CONTIGUOUS BLOCK UPDATE VERB
R0078     21E            NUMBER OF COMPONENTS FOR STATE VECTOR UPDATE
R0080    AAAAE           ECADR OF «UPSVFLAG«
R0082   XXXXXE           STATE VECTOR IDENTIFIER' 00001 FOR CSM, 77776 FOR LEM - EARTH SPHERE OF INFLUENCE SCALING
R0083                                              00002 FOR CSM, 77775 FOR LEM - LUNAR SPHERE OF INFLUENCE SCALING
R0084   XXXXXEXXXXXE     X POSITION
R0086   XXXXXEXXXXXE     Y POSITION
R0088   XXXXXEXXXXXE     Z POSITION
R0090   XXXXXEXXXXXE     X VELOCITY
R0092   XXXXXEXXXXXE     Y VELOCITY
R0094   XXXXXEXXXXXE     Z VELOCITY
R0096   XXXXXEXXXXXE     TIME FROM AGC CLOCK ZERO
R0098   V33E             VERB 33 TO SIGNAL THAT THE STATE VECTOR IS READY TO BE STORED.
R0144   2. REFSMMAT(ALL DATA ENTRIES IN OCTAL)
R0145   ENTRIES'         DATA DEFINITIONS'                                   SCALE FACTORS'
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R0147  V71E          CONTIGUOUS BLOCK UPDATE VERB
R0148    24E         NUMBER OF COMPONENTS FOR REFSMMAT UPDATE
R0150   AAAAE        ECADR OF «REFSMMAT»
R0152  XXXXXEXXXXXE  ROW 1 COLUMN 1                                   2(-1)
R0154  XXXXXEXXXXXE  ROW 1 COLUMN 2                                   2(-1)
R0156  XXXXXEXXXXXE  ROW 1 COLUMN 3                                   2(-1)
R0158  XXXXXEXXXXXE  ROW 2 COLUMN 1                                   2(-1)
R0160  XXXXXEXXXXXE  ROW 2 COLUMN 2                                   2(-1)
R0162  XXXXXEXXXXXE  ROW 2 COLUMN 3                                   2(-1)
R0164  XXXXXEXXXXXE  ROW 3 COLUMN 1                                   2(-1)
R0166  XXXXXEXXXXXE  ROW 3 COLUMN 2                                   2(-1)
R0168  XXXXXEXXXXXE  ROW 3 COLUMN 3                                   2(-1)
R0170  V33E          VERB 33 TO SIGNAL THAT REFSMMAT IS READY TO BE STORED.
 0171                      07,3717                    BANK   07
 0172  REF  4 LAST  538   43,2000                    SETLOC EXTVERBS
 0173                      43,3722                    BANK

 0174  REF 13 LAST  741   E3,1706                    EBANK= TEPHEM

                                                     COUNT* $$/P27
 0175  REF  1
 0176  REF  1             43,3722  3 4714 1  V70UPDAT CAF    UP70        COMES HERE ON V70E
 0177  REF  2 LAST  230   43,3723  1 3731 0           TCF    V73UPDAT +1
 0178  REF  1             43,3724  3 4712 1  V71UPDAT CAF    UP71        COMES HERE ON V71E
 0179  REF  3 LAST 1467   43,3725  1 3731 0           TCF    V73UPDAT +1
 0180  REF  1             43,3726  3 4711 1  V72UPDAT CAF    UP72        COMES HERE ON V72E
 0181  REF  4 LAST 1467   43,3727  1 3731 0           TCF    V73UPDAT +1
 0182  REF  1             43,3730  3 6214 0  V73UPDAT CAF    UP73        COMES HERE ON V73E

 0183  REF  1             43,3731 54 331 1    +1     TS     UPVERBSV    SAVE UPVERB UNTIL IT=S OK TO ENTER P27

 0184  REF 18 LAST  261   43,3732  0 2076 1           TC     TESTXACT    GRAB DISPLAY IF AVAILABLE, OTHERWISE
A0185                                                                   TURN+OPERATOR ERROR* ON AND TERMINATEJOB

 0186  REF 18 LAST 1372   43,3733  3 1011 0           CA     MODREG      CHECK IF UPDATE ALLOWED
 0187                      43,3734  0 0006 1           EXTEND             FIRST CHECK FOR MODREG = +0, -0
 0188                      43,3735  1 3737 0           BZF    +2          (+0 = P00, -0 = FRESH START)
 0189  REF  1             43,3736  0 3747 0           TC     CKMDMORE    NOW CHECK FOR PROGRAM WHICH CAN BE
A0190                                                                   INTERRUPTED BY P27.

 0191  REF 19 LAST 1467   43,3737 31«011 0           CAE    MODREG      UPDATE ALLOWED.
 0192  REF  2 LAST   70   43,3740 54 301 1           TS     UPOLDMOD    SAVE CURRENT MAJOR MODE
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0193  REF   2  LAST 1467   43,3741  30 331 0          CAE   UPVERBSV      SET UPVERB TO INDICATE TO P27
0194  REF   2  LAST   70   43,3742  54 302 1          TS    UPVERB        WHICH EXTENDED VERB CALLED IT.

0195  REF 175  LAST 1454   43,3743  3 4712 1          CAF   ONE
0196  REF   2  LAST   70   43,3744  54 303 0          TS    UPCOUNT       INITIALIZE UPCOUNT TO 1

0197  REF  65  LAST 1463   43,3745  0 4574 0          TC    POSTJUMP      LEAVE EXTENDED VERB BANK AND
0198  REF   1              43,3746   57364 1          CADR  UPPART2       GO TO UPDATE PROGRAM(P27) BANK.
0199  REF  16  LAST 1417   43,3747  4 0101 0  CKMDMORE CS    FLAGWRD5
0200  REF  33  LAST 1444   43,3750  7 4703 0          MASK  BIT8          CHECK IF COMPUTER IS LGC
0201  REF 424  LAST 1463   43,3751  10 000 0          CCS   A             IS COMPUTER LGC OR AGC
0202  REF   1              43,3752  1 3760 1  UPERLEM TCF   UPERROR       ERROR- IT'S THE LEM + MODE IS NOT P00.
0203  REF  79  LAST 1463   43,3753  4 4711 0          CS    TWO
0204  REF  20  LAST 1467   43,3754  7 1011 1          MASK  MODREG
0205  REF 425  LAST 1468   43,3755  10 000 0          CCS   A
0206  REF   2  LAST 1468   43,3756  1 3760 1  UPERCMC TCF   UPERROR       ERROR- IT'S THE CMC AND MODE IS NOT
A0207                                                                     P00 OR P02.
0208  REF 361  LAST 1464   43,3757  0 0002 0          TC    Q             ALLOW UPDATE TO PROCEED

0209  REF  66  LAST 1468   43,3760  0 4574 0  UPERROR  TC    POSTJUMP      TURN ON "OPERATOR ERROR" LIGHT
0210  REF   1              43,3761   57745 0          CADR  UPERROUT +2   GO TO COMMON UPDATE PROGRAM EXIT

0211  REF 285  LAST 1456      4714           UP70      EQUALS ZERO
0212  REF 176  LAST 1468      4712           UP71      EQUALS ONE
0213  REF  80  LAST 1468      4711           UP72      EQUALS TWO
0214  REF  53  LAST 1450      6214           UP73      EQUALS THREE
0215                        04,3650                    BANK  04
0216  REF   2  LAST 1300   27,2000                     SETLOC UPDATE2
0217                        27,3364                    BANK

0218  REF   1                                          COUNT* $$/P27

0219                        27,3364           UPPART2   EQUALS              UPDATE PROGRAM - PART 2

0220  REF 102  LAST 1414   27,3364  0 5301 0          TC    PHASCHNG      SET RESTART GROUP 6 TO RESTORE OLD MODE
0221                        27,3365   07026 1          OCT   07026         AND DOWNLIST AND EXIT IF RESTART OCCURS.
0222                        27,3366   30000 1          OCT   30000         PRIORITY SAME AS CHRPRIO
0223  REF   7  LAST  173       0304                    EBANK= UPBUFF
0224  REF   1              27,3367  03675 0          2CADR UPOUT +1
0224  REF   1              27,3370  56100 0

0225  REF 177  LAST 1468   27,3371  3 4712 1          CAF   ONE
0226  REF   7  LAST 1067   27,3372  54 332 1          TS    DNLSTCOD      DOWNLIST

0227  REF  13  LAST  754   27,3373  0 5243 1          TC    NEWMODEX      SET MAJOR MODE = 27
0228                        27,3374   00033 1          DEC   27
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0229  REP   3  LAST 1468   27,3375  50 302 0          INDEX  UPVERB     BRANCH DEPENDING ON WHETHER THE UPDATE
0230                       27,3376  1 3377 0          TCF    +1         VERB REQUIRES A FIXED OR VARIABLE NUMBER
0231                       27,3377  1 3402 0          TCF    +3         V70 FIXED.              (OF COMPONENTS.
0232  REP   1              27,3400  1 3405 1          TCF    CHWELL1    V71 VARIABLE - GO GET NO. OF COMPONENTS
0233  REP   2  LAST 1469   27,3401  1 3405 1          TCF    CHWELL1    V72 VARIABLE - GO GET NO. OF COMPONENTS
0234  REP  81  LAST 1468   27,3402  3 4711 1          CA     TWO        V73 (AND V70) FIXED
0235  REP   4  LAST  173   27,3403  54 300 0          TS     COMPNUMB   SET NUMBER OF COMPONENTS TO 2.
0236  REP   1              27,3404  1 3430 1          TCF    CHWELL2    GO GET THE TWO UPDATE COMPONENTS

0237  REP   1              27,3405  3 3500 1  CHWELL1 CAF    ADUPBUFF   * REQUEST USER TO SEND NUMBER  *
0238  REP 726  LAST 1452   27,3406  54 156 1          TS     MPAC +2    * OF COMPONENTS PARAMETER(II). *
0239  REP   1              27,3407  3 3501 0    +2    CAF    UPLOADNV   (CK4V32 RETURNS HERE IF V32 ENCOUNTERED)
0240  REP 249  LAST 1463   27,3410  0 4555 0          TC     BANKCALL   DISPLAY A FLASHING V21N01
0241  REP  13  LAST  623   27,3411   20465 1          CADR   GOXDSPF    TO REQUEST II.
0242  REP   1              27,3412  1 3675 1          TCF    UPOUT4     V34 TERMINATE UPDATE(P27) RETURN
0243  REP   3  LAST 1469   27,3413  1 3407 0          TCF    CHWELL1 +2
0244  REP   1              27,3414  0 3471 0          TC     CK4V32     DATA OR V32 RETURN
0245  REP  46  LAST 1363   27,3415  4 4711 0          CS     BIT2
0246  REP   8  LAST 1468   27,3416  6 0304 0          AD     UPBUFF     IS II(NUMBER OF COMPONENTS PARAMETER)
0247                       27,3417  0 0006 1          EXTEND            .GE. 3 AND .LE. 20D.
0248  REP   4  LAST 1469   27,3420  6 3407 1          BZMF   CHWELL1 +2
0249  REP   9  LAST 1469   27,3421  4 0304 1          CS     UPBUFF
0250  REP   1              27,3422  6 4376 1          AD     UP21
0251                       27,3423  0 0006 1          EXTEND
0252  REP   5  LAST 1469   27,3424  6 3407 1          BZMF   CHWELL1 +2
0253  REP  10  LAST 1469   27,3425  30 304 0          CAE    UPBUFF
0254  REP   5  LAST 1469   27,3426  54 300 0          TS     COMPNUMB   SAVE II IN COMPNUMB
R0257          UPBUFF LOADING SEQUENCE

02571 REP   3  LAST 1468   27,3427  24 303 1          INCR   UPCOUNT    INCREMENT COUNT OF COMPONENTS RECEIVED.
0258  REP   1              27,3430  3 3645 0  CHWELL2 CAF    ADUPBFM1   CALCULATE LOCATION(ECADR) IN UPBUFF
0259  REP   4  LAST 1469   27,3431  6 0303 1          AD     UPCOUNT    WHERE NEXT COMPONENT SHOULD BE STORED.
0260  REP 727  LAST 1469   27,3432  54 156 1    +2    TS     MPAC +2    PLACE ECADR INTO R3.
0261  REP   2  LAST 1469   27,3433  3 3501 0    +3    CAF    UPLOADNV   (CK4V32 RETURNS HERE IF V32 ENCOUNTERED)
0262  REP 250  LAST 1469   27,3434  0 4555 0          TC     BANKCALL   DISPLAY A FLASHING V21N01
0263  REP  14  LAST 1469   27,3435   20465 1          CADR   GOXDSPF    TO REQUEST DATA.
0264  REP   2  LAST 1469   27,3436  1 3675 1          TCF    UPOUT4     V34 TERMINATE UPDATE(P27) RETURN.
0265  REP   2  LAST 1469   27,3437  1 3433 1          TCF    CHWELL2 +3 V33 PROCEED RETURN
0266  REP   2  LAST 1469   27,3440  0 3471 0          TC     CK4V32     DATA OR V32 RETURN
0267  REP   5  LAST 1469   27,3441  4 0303 0          CS     UPCOUNT    HAVE WE FINISHED RECEIVING ALL
0268  REP   6  LAST 1469   27,3442  6 0300 1          AD     COMPNUMB   THE DATA WE EXPECTED.
0269                       27,3443  0 0006 1          EXTEND
0270  REP   1              27,3444  6 3446 1          BZMF   UPVERIFY   YES- GO TO VERIFICATION SEQUENCE
0272  REP   3  LAST 1469   27,3445  1 3427 1          TCF    CHWELL2 -1 NO- REQUEST ADDITIONAL DATA.
R0273          VERIFY SEQUENCE
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0274  REF   1                  27,3446  3 3477 0  UPVERIFY CAF    ADUPTEMP     PLACE ECADR WHERE COMPONENT NO. INDEX
0275  REF 728  LAST 1469       27,3447  54 156 1            TS     MPAC +2      IS TO BE STORED INTO R3.
0276  REF   1                  27,3450  3 3502 0            CAF    UPVRFYNV     (CK4V32 RETURNS HERE IF V32 ENCOUNTERED)
0277  REF 251  LAST 1469       27,3451  0 4555 0            TC     BANKCALL     DISPLAY A FLASHING V21N02 TO REQUEST
0278  REF  15  LAST 1469       27,3452   20465 1            CADR   GOXDSPF      DATA CORRECTION OR VERIFICATION.
0279  REF   3  LAST 1469       27,3453  1 3675 1            TCF    UPOUT4       V34 TERMINATE UPDATE(P27) RETURN
0280  REF   1                  27,3454  1 3503 0            TCF    UPSTORE      V33 DATA SENT IS GOOD. GO STORE IT.
0281  REF   3  LAST 1469       27,3455  0 3471 0            TC     CK4V32       COMPONENT NO. INDEX OR V32 RETURN
0282  REF   2  LAST   70       27,3456  3 0330 1            CA     UPTEMP       DOES THE COMPONENT NO. INDEX JUST SENT
0283                           27,3457  0 0006 1            EXTEND              SPECIFY A LEGAL COMPONENT NUMBER
0284  REF   2  LAST 1469       27,3460  6 3446 1            BZMF   UPVERIFY     NO, IT IS NOT POSITIVE NONZERO
0285  REF   3  LAST 1470       27,3461  4 0330 0            CS     UPTEMP
0288  REF   7  LAST 1469       27,3462  6 0300 1            AD     COMPNUMB
0289  REF  82  LAST 1433       27,3463  6 4712 1            AD     BIT1
0290                           27,3464  0 0006 1            EXTEND
0291  REF   3  LAST 1470       27,3465  6 3446 1            BZMF   UPVERIFY     NO
0292  REF   2  LAST 1469       27,3466  3 3645 0            CAF    ADUPBFM1     YES- BASED ON THE COMPONENT NO. INDEX
0293  REF   4  LAST 1470       27,3467  6 0330 1            AD     UPTEMP       CALCULATE THE ECADR OF LOCATION IN
0294  REF   4  LAST 1469       27,3470  1 3432 0            TCF    CHWELL2 +2   UPBUFF WHICH USER WANTS TO CHANGE.

0295  REF   2  LAST 1468       27,3675            UPOUT4   EQUALS UPOUT +1      COMES HERE ON V34 TO TERMINATE UPDATE
R0296          CHECK FOR VERB 32 SEQUENCE

0297  REF 729  LAST 1470       27,3471  4 0154 0  CK4V32   CS     MPAC         ON DATA RETURN FROM «GOXDSPF«
0298  REF  57  LAST 1445       27,3472  7 4705 0            MASK   BIT6         ON DATA RETURN FROM ßGOXDSPßd THE CON-
0299  REF 426  LAST 1468       27,3473  10 000 0            CCS    A            TENTS OF MPAC = VERB.  SO TEST FOR V32.
0300  REF 362  LAST 1468       27,3474  0 0002 0            TC     Q            IT«S NOT A V32, IT«S DATA.  PROCEED.
0301  REF 363  LAST 1470       27,3475  50 002 0            INDEX  Q
0302                           27,3476  7«7771 0            TC     0 -6         V32 ENCOUNTERED - GO BACK AND GET DATA

0305  REF   5  LAST 1470       27,3477   00330 1  ADUPTEMP ADRES  UPTEMP       ADDRESS OF TEMP STORAGE FOR CORRECTIONS
0306  REF  11  LAST 1469       27,3500   00304 0  ADUPBUFF ADRES  UPBUFF       ADDRESS OF UPDATE DATA STORAGE BUFFER
0307                           27,3501   05201 1  UPLOADNV VN     2101         VERB 21 NOUN 01
0308                           27,3502   05202 1  UPVRFYNV VN     2102         VERB 21 NOUN 02
0309  REF   3  LAST 1174         4376            UP21     =      MD1          DEC 21 = MAX NO OF COMPONENTS +1
03121 REF  30  LAST 1435         4715            UPDTPHAS EQUALS FIVE

R0313          PRE-STORE AND FAN TO APPROPRIATE BRANCH SEQUENCE

0314                       27,3503            UPSTORE  EQUALS              GROUND HAS VERIFIED UPDATE. STORE DATA.

0315                       27,3503  0 0004 0           INHINT

0316  REF  25  LAST 1463   27,3504  30 103 0           CAE    FLAGWRD7     INVERT VERIFLAG(BIT3 OF FLAGWRD7) TO
0317  REF 251  LAST 1464   27,3505  56 001 0           XCH    L            INDICATE TO THE GROUND(VIA DOWNLINK)
0318  REF  39  LAST 1448   27,3506  3 4710 0           CAF    BIT3         THAT THE V33(WHICH THE GROUND SENT TO
0319                       27,3507  0 0006 1           EXTEND              VERIFY THE UPDATE) HAS BEEN SUCCESSFULLY
0320  REF  17  LAST 1454   27,3510  06 001 0           RXOR   LCHAN        RECEIVED BY THE UPDATE PROGRAM
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0321  REF  26  LAST 1470   27,3511  54 103 1          TS      FLAGWRD7

0322  REF 103  LAST 1468   27,3512  0 5301 0          TC      PHASCHNG        SET RESTART GROUP 6 TO REDO THE UPDATE
0323                       27,3513   04026 1          OCT     04026           DATA STORE IF A RESTART OCCURS.
0324                       27,3514  0 0004 0          INHINT                  (BECAUSE PHASCHNG DID A RELINT)

0325  REF  82  LAST 1469   27,3515  4 4711 0          CS      TWO             GO TO UPFNDVAC IF INSTALL IS REQUIRED,
0326  REF   4  LAST 1469   27,3516  6 0302 0          AD      UPVERB          THAT IS, IF IT«S A V70 - V72.
0327                       27,3517  0 0006 1          EXTEND                  GO TO UPEND73 IF IT«S A V73.
0328  REF   1              27,3520  6 3527 1          BZMF    UPFNDVAC

R0330                VERB 73 BRANCH

0331                       27,3521  0 0006 1 UPEND73  EXTEND                  V73-PERFORM DP OCTAL AGC CLOCK INCREMENT
0332  REF  12  LAST 1470   27,3522  3 0305 1          DCA     UPBUFF
0333  REF  13  LAST 1471   27,3523  52 315 1          DXCH    UPBUFF +8D
0334  REF   1              27,3524  0 3552 0          TC      TIMEDIDL
0335  REF   7  LAST  358   27,3525  0 4400 1          TC      FALTON          ERROR- TURN ON *OPERATOR ERROR* LIGHT
0336  REF   3  LAST 1470   27,3526  0 3675 0          TC      UPOUT +1        GO TO COMMON UPDATE PROGRAM EXIT

0337  REF   7  LAST 1417   27,3527  3 4371 0 UPFNDVAC CAF     CHRPRIO         (USE EXTENDED VERB PRIORITY)
0338  REF  34  LAST 1446   27,3530  0 5042 1          TC      FINDVAC         GET VAC AREA FOR «CALL INTSTALL«
0339  REF  14  LAST 1467   E3,1706                    EBANK=  TEPHEM
0340  REF   1              27,3531   03534 0          2CADR   UPJOB           (NOTE' THIS WILL ALSO SET EBANK FOR
0340  REF   1              27,3532   56103 0
0341  REF 122  LAST 1463   27,3533  0 5112 0          TC      ENDOPJOB        «TEPHEM« UPDATE BY V70)

0342  REF 245  LAST 1336   27,3534  0 6006 1 UPJOB    TC      INTPRET         THIS COULD BE A STATE VECTOR UPDATE--SO
0343                       27,3535   77624 1          CALL                    WAIT(PUT JOB TO SLEEP) IF ORBIT INT(OI)
0344  REF  32  LAST 1298   27,3536   27371 1                   INTSTALL        IS IN PROGRESS--OR--GRAB OI AND RETURN
A0345                                                                        TO UPWAKE IF OI IS NOT IN PROGRESS.

0346                       27,3537   77776 1 UPWAKE    EXIT

0347  REF 104  LAST 1471   27,3540  0 5301 0          TC      PHASCHNG        RESTART PROTECT(GROUP 6)
0348                       27,3541   04026 1          OCT     04026

0350  REF  55  LAST 1444   27,3542  0 5435 0          TC      UPFLAG          SET INTEGRATION RESTART BIT
0351  REF   5  LAST 1317   27,3543   00236 0          ADRES   REINTFLG
0352                       27,3544  0 0004 0          INHINT
0355                       27,3545          UPPART3   EQUALS

0356  REF   5  LAST 1471   27,3545  50 302 0          INDEX   UPVERB          BRANCH TO THE APPROPRIATE UPDATE VERB
0357                       27,3546  1 3547 0          TCF     +1              ROUTINE TO ACTUALLY PERFORM THE UPDATE
0358  REF   1              27,3547  1 3706 1          TCF     UPEND70         V70
0359  REF   1              27,3550  1 3615 1          TCF     UPEND71         V71
0360  REF   1              27,3551  1 3647 0          TCF     UPEND72         V72
R0361                ROUTINE TO INCREMENT CLOCK(TIME2,TIME1) WITH CONTENTS OF DP WORD AT UPBUFF.
```

```
0363                        27,3552  0 0006 1  TIMEDIDL EXTEND
0364  REF   6  LAST 1470   27,3553  22 330 1           QXCH  UPTEMP          SAVE Q FOR RETURN
0365  REF 286  LAST 1468   27,3554  3 4714 1           CAF   ZERO           ZERO AND SAVE TIME2,TIME1
0366                        27,3555  22 007 0           ZL
0367  REF  34  LAST 1416   27,3556  52 025 1           DXCH  TIME2
0368  REF  14  LAST 1471   27,3557  52 327 0           DXCH  UPBUFF +18D    STORE IN CASE OF OVERFLOW

0369  REF   1               27,3560  3 4715 0           CAF   UPDTPHAS       DO
0370  REF 252  LAST 1470   27,3561  54 001 1           TS    L              A
0371                        27,3562  4 0000 0           COM                  QUICK
03711 REF   3  LAST  652    27,3563  52 765 1           DXCH  -PHASE6        PHASCHNG

0372                        27,3564  0 0004 0  TIMEDIDR INHINT

0373  REF 287  LAST 1472   27,3565  3 4714 1           CAF   ZERO
0374                        27,3566  22 007 0           ZL                   PICK UP INCREMENTER(AND ZERO
0375  REF 730  LAST 1470   27,3567  54 156 1           TS    MPAC +2        IT IN CASE OF RESTARTS) AND
0376  REF  15  LAST 1472   27,3570  52 315 1           DXCH  UPBUFF +8D     STORE IT
0377  REF 731  LAST 1472   27,3571  52 155 1           DXCH  MPAC           INTO MPAC FOR TPAGREE.

0378                        27,3572  0 0006 1           EXTEND
0379  REF  16  LAST 1472   27,3573  3 0327 1           DCA   UPBUFF +18D
0380  REF 732  LAST 1472   27,3574  20 155 1           DAS   MPAC           FORM SUM IN MPAC
0381                        27,3575  0 0006 1           EXTEND
0382  REF   1               27,3576  1 3605 0           BZF   DELTATOK       TEST FOR OVERFLOW
0383  REF 288  LAST 1472   27,3577  3 4714 1           CAF   ZERO
0384  REF  17  LAST 1472   27,3600  52 327 0           DXCH  UPBUFF +18D    OVERFLOW, RESTORE OLD VALUE OF CLOCK
0385  REF  35  LAST 1472   27,3601  20 025 1           DAS   TIME2          AND TURN ON OPERATOR ERROR

0386  REF 105  LAST 1471   27,3602  0 5301 0           TC    PHASCHNG       RESTART PROTECT(GROUP 6)
0387                        27,3603   04026 1           OCT   04026

0388  REF   7  LAST 1472   27,3604  0 0330 1           TC    UPTEMP         GO TO ERROR EXIT

0389  REF  14  LAST 1416   27,3605  0 7226 0  DELTATOK TC    TPAGREE        FORCE SIGN AGREEMENT
0390  REF 733  LAST 1472   27,3606  52 155 1           DXCH  MPAC
0391  REF  36  LAST 1472   27,3607  20 025 1           DAS   TIME2          INCREMENT TIME2,TIME1

0392  REF 106  LAST 1472   27,3610  0 5301 0           TC    PHASCHNG       RESTART PROTECT(GROUP 6)
0393                        27,3611   04026 1           OCT   04026

0394                        27,3612  0 0004 0           INHINT
0395  REF   8  LAST 1472   27,3613  50 330 1           INDEX UPTEMP         (CODED THIS WAY FOR RESTART PROTECTION)
0396                        27,3614  0 0001 0           TC    1              NORMAL RETURN
R0397           VERB 71 BRANCH

0402  REF  18  LAST 1472   27,3615  30 305 1  UPEND71  CAE   UPBUFF +1       SET EBANK
0403  REF  66  LAST 1443   27,3616  54 003 0           TS    EBANK              AND
0404  REF  17  LAST 1403   27,3617  7 4373 0           MASK  LOW8           CALCULATE
0405  REF   9  LAST 1472   27,3620  54 330 0           TS    UPTEMP         S-REG VALUE OF RECEIVING AREA
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0406  BBF   5  LAST 1403   27,3621  6 7714 1        AD     NEG3      IN THE PROCESS OF
0407  BBF   8  LAST 1470   27,3622  6 0300 1        AD     COMPNUMB  PERFORMING
0408                       27,3623  0 0006 1        EXTEND           THIS UPDATE
0409  BBF   1               27,3624  1 3632 1        BZF    STORLP71  WILL WE
0410  BBF  39  LAST 1435   27,3625  7 4702 1        MASK   BIT9      OVERFLOW
0411  BBF 427  LAST 1470   27,3626 10 000 0        CCS    A         INTO THE NEXT EBANK....
0412  BBF   2  LAST 1468   27,3627  1 3743 0        TCF    UPERROUT  YES

0413  BBF   6  LAST 1473   27,3630  3 7714 1        CA     NEG3      NO- CALCULATE NUMBER OF
0414  BBF   9  LAST 1473   27,3631  6 0300 1        AD     COMPNUMB  WORDS TO BE STORED MINUS ONE
0415  BBF 734  LAST 1472   27,3632 54 154 0  STORLP71 TS     MPAC      SAVE NO. OF WORDS REMAINING MINUS ONE
0416  BBF 428  LAST 1473   27,3633 50 000 1        INDEX  A         TAKE NEXT UPDATE WORD FROM
0417  BBF  19  LAST 1472   27,3634  3 0306 1        CA     UPBUFF +2 UPBUFF AND
0418  BBF 253  LAST 1472   27,3635 54 001 1        TS     L         SAVE IT IN L
0419  BBF 735  LAST 1473   27,3636  3 0154 1        CA     MPAC      CALCULATE NEXT
0420  BBF  10  LAST 1472   27,3637  6 0330 1        AD     UPTEMP    RECEIVING ADDRESS
0421  BBF 429  LAST 1473   27,3640 50 000 1        INDEX  A
0422                       E3,1400                 EBANK= 1400
0423                       27,3641 23=400 1        LXCH   1400      UPDATE THE REGISTER  BY CONTENTS OF L
0424  BBF  15  LAST 1471   E3,1706                 EBANK= TEPHEM
0425  BBF 736  LAST 1473   27,3642 10 154 0        CCS    MPAC      ARE THERE ANY WORDS LEFT TO BE STORED
0426  BBF   2  LAST 1473   27,3643  1 3632 1        TCF    STORLP71  YES
0427  BBF   4  LAST 1471   27,3644  1 3674 0        TCF    UPOUT     NO- THEN EXIT UPDATE PROGRAM
0428  BBF  20  LAST 1473   27,3645   00303 1  ADUPBFM1 ADRES  UPBUFF -1 SAME AS ADUPBUFF BUT LESS 1 (DON=T MOVE)
0429  BBF   5  LAST 1473   27,3646  1 3674 0        TCF    UPOUT     NO- EXIT UPDATE(HERE WHEN COMPNUMB = 3)
R0430                      VERB 72 BRANCH

0431  BBF  83  LAST 1470   27,3647  3 4712 1  UPEND72 CAF    BIT1      HAVE AN ODD NO. OF COMPONENTS
0432  BBF  10  LAST 1473   27,3650  7 0300 0        MASK   COMPNUMB  BEEN SENT FOR A V72 UPDATE...
0433  BBF 430  LAST 1473   27,3651 10 000 0        CCS    A
0434                       27,3652  1 3654 1        TCF    +2        YES
0435  BBF   3  LAST 1473   27,3653  1 3743 0        TCF    UPERROUT  ERROR- SHOULD BE ODD NO. OF COMPONENTS
0451  BBF  47  LAST 1469   27,3654  4 4711 0        CS     BIT2
0452  BBF  11  LAST 1473   27,3655  6 0300 1        AD     COMPNUMB
0453  BBF 737  LAST 1473   27,3656 54 154 0  LDLOOP72 TS     MPAC      NOW PERFORM THE UPDATE
0454  BBF 431  LAST 1473   27,3657 50 000 1        INDEX  A
0455  BBF  21  LAST 1473   27,3660 30 305 1        CAE    UPBUFF +1 PICK UP NEXT UPDATE WORD
0456  BBF 432  LAST 1473   27,3661 22 000 1        LXCH   A
0457  BBF 738  LAST 1473   27,3662 10 154 0        CCS    MPAC      SET POINTER TO ECADR(MUST BE CCS)
0458  BBF 739  LAST 1473   27,3663 54 154 0        TS     MPAC
0459  BBF 433  LAST 1473   27,3664 50 000 1        INDEX  A
0460  BBF  22  LAST 1473   27,3665 30 305 1        CAE    UPBUFF +1 PICK UP NEXT ECADR OF REG TO BE UPDATED
0461  BBF  67  LAST 1472   27,3666 54 003 0        TS     EBANK     SET EBANK
0462  BBF  18  LAST 1472   27,3667  7 4373 0        MASK   LOW8      ISOLATE RELATIVE ADDRESS
0463  BBF 434  LAST 1473   27,3670 50 000 1        INDEX  A
0464                       E3,1400                 EBANK= 1400
0465                       27,3671 23=400 1        LXCH   1400      UPDATE THE REGISTER BY CONTENTS OF L
0466  BBF  16  LAST 1473   E3,1706                 EBANK= TEPHEM
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0467  REP 740  LAST 1473   27,3672  10 154 0          CCS   MPAC      ARE WE THROUGH THE V72 UPDATE...
0468  REP   1               27,3673   1 3656 0          TCF   LDLOOP72   NO
R0469          NORMAL FINISH OF P27

0470                       27,3674                UPOUT  EQUALS
0471  REP   1              27,3674   0 2662 1          TC    INTWAKEU    RELEASE  GRAB  OF ORBITAL INTEGRATION
0472  REP   3  LAST 1467  27,3675  30 301 0    +1    CAE   UPOLDMOD    RESTORE PRIOR P27 MODE
0473  REP  14  LAST 1468  27,3676   0 5246 1          TC    NEWMODEX +3
0474  REP 289  LAST 1472  27,3677   3 4714 1          CAF   ZERO
0475  REP   8  LAST 1468  27,3700  54 332 1          TS    DNLSTCOD
0476  REP   3  LAST  583  27,3701   0 3750 0          TC    UPACTOFF    TURN OFF "UPLINK ACTIVITY" LIGHT

0477                       27,3702   0 0006 1          EXTEND
0478  REP  17  LAST 1392  27,3703   3 4714 1          DCA   NEG0       KILL GROUP 6.
0479  REP   4  LAST 1472  27,3704  52 765 1          DXCH  -PHASE6

0480  REP  38  LAST  891  27,3705   0 5423 1          TC    ENDEXT      EXTENDED VERB EXIT
R0481          VERB 70 BRANCH

0482                       27,3706   0 0006 1  UPEND70 EXTEND
0483  REP  23  LAST 1473  27,3707   4 0305 0          DCS   UPBUFF      V70 DOES THE FOLLOWING WITH DP DELTA
0484  REP  24  LAST 1474  27,3710  52 315 1          DXCH  UPBUFF +8D  TIME IN UPBUFF
0485  REP   2  LAST 1471  27,3711   0 3552 0          TC    TIMEDIDL    DECREMENT AGC CLOCK

0486  REP   4  LAST 1473  27,3712   0 3743 1          TC    UPERROUT    ERROR WHILE DECREMENTING CLOCK -- EXIT

0487  REP  17  LAST 1473  E3,1706                     EBANK= TEPHEM
0488                       27,3713   0 0006 1          EXTEND
0489  REP  25  LAST 1474  27,3714   4 0305 0          DCS   UPBUFF      COPY DECREMENTERS FOR
0490  REP  26  LAST 1474  27,3715  52 317 0          DXCH  UPBUFF +10D RESTART PROTECTION
0491                       27,3716   0 0006 1          EXTEND
0492  REP  27  LAST 1474  27,3717   4 0305 0          DCS   UPBUFF
0493  REP  28  LAST 1474  27,3720  52 321 0          DXCH  UPBUFF +12D

0494  REP 107  LAST 1472  27,3721   0 5301 0          TC    PHASCHNG    RESTART PROTECT(GROUP 6)
0495                       27,3722    04026 1          OCT   04026

0496  REP 290  LAST 1474  27,3723   3 4714 1          CAF   ZERO
0497                       27,3724  22 007 0          ZL
0498  REP  29  LAST 1474  27,3725  52 317 0          DXCH  UPBUFF +10D DECREMENT CSM STATE VECTOR TIME
0499  REP   3  LAST  204  27,3726  21"571 1          DAS   TETCSM

0500  REP 291  LAST 1474  27,3727   3 4714 1          CAF   ZERO
0501                       27,3730  22 007 0          ZL
0502  REP  30  LAST 1474  27,3731  52 321 0          DXCH  UPBUFF +12D DECREMENT LEM STATE VECTOR TIME
0503  REP   3  LAST   84  27,3732  21"643 0          DAS   TETLEM
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 0504   REF 292  LAST 1474   27,3733  3 4714 1          CAF    ZERO
 0505                        27,3734  22 007 0          ZL
 0506   REF  31  LAST 1474   27,3735  52 305 0          DXCH   UPBUFF
 0507   REF  18  LAST 1474   27,3736  21=710 1          DAS    TEPHEM +1       INCREMENT TP TEPHEM
 0508   REF  19  LAST 1475   27,3737  27=706 0          ADS    TEPHEM

 0509   REF 108  LAST 1474   27,3740  0 5301 0          TC     PHASCHNG        RESTART PROTECT(GROUP 6)
 0510                        27,3741   04026 1          OCT    04026

 0511   REF  32  LAST 1475      0304                    EBANK= UPBUFF

 0512   REF   6  LAST 1473   27,3742  0 3674 1          TC     UPOUT           GO TO STANDARD UPDATE PROGRAM EXIT
R0513           ERROR SEQUENCE

 0514   REF   8  LAST 1471   27,3743  0 4400 1 UPERROUT TC     PALTON          TURN ON *OPERATOR ERROR* LIGHT
 0515   REF   7  LAST 1475   27,3744  1 3674 0          TCF    UPOUT           GO TO COMMON UPDATE PROGRAM EXIT

 0516   REF   9  LAST 1475   27,3745  0 4400 1   +2     TC     PALTON          TURN ON =OPERATOR ERROR= LIGHT
 0517   REF   4  LAST 1474   27,3746  0 3750 0          TC     UPACTOFF        TURN OFF=UPLINK ACTIVITY=LIGHT
 0518   REF  39  LAST 1474   27,3747  0 5423 1          TC     ENDEXT          EXTENDED VERB EXIT
A0519                                                                        (THE PURPOSE OF UPERROUT +2 EXIT IS
A0520                                                                        TO PROVIDE AN ERROR EXIT WHICH DOES NOT
A0521                                                                        RESET ANY RESTART GROUPS)
A0522
R0523           'UPACTOFF' IS A ROUTINE TO TURN OFF UPLINK ACTIVITY LIGHT ON ALL EXITS FROM UPDATE PROGRAM(P27).

 0525   REF  40  LAST 1470   27,3750  4 4710 1 UPACTOFF CS     BIT3
 0527                        27,3751  0 0006 1          EXTEND                  TURN OFF UPLINK ACTIVITY LIGHT
 0528   REF  36  LAST 1448   27,3752  03 011 1          WAND   DSALMOUT        (BIT 3 OF CHANNEL 11)
 0530   REF 384  LAST 1470   27,3753  0 0002 0          TC     Q
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0001                    22,3505                 BANK    22
0002   REP   1          22,2000                 SETLOC  RTBCODES
0003                    22,3505                 BANK

0004   REP  13  LAST 1327   E5,1713              EBANK=  XNB
0005   REP   1                                  COUNT*  $$/RTB

R0006          LOAD TIME2, TIME1 INTO MPAC'

0007                    22,3505  0 0006 1  LOADTIME EXTEND
0008   REP  37  LAST 1472   22,3506  3 0025 0        DCA     TIME2
0009   REP   2  LAST 1094   22,3507  1 6024 0        TCF     SLOAD2

R0010          CONVERT THE SINGLE PRECISION 2'S COMPLEMENT NUMBER ARRIVING IN MPAC (SCALED IN HALF-REVOLUTIONS) TO A
R0012  DP 1'S COMPLEMENT NUMBER SCALED IN REVOLUTIONS.

0016   REP 741  LAST 1474   22,3510  10 154 0  CDULOGIC CCS    MPAC
0017   REP 293  LAST 1475   22,3511  3 4714 1         CAF     ZERO
0018                    22,3512  1 3515 1         TCF     +3
0019                    22,3513  13 514 0         NOOP
0020   REP  25  LAST 1177   22,3514  4 4675 0         CS      HALF

0021   REP 742  LAST 1476   22,3515  54 155 1         TS      MPAC +1
0022   REP 294  LAST 1476   22,3516  3 4714 1         CAF     ZERO
0023   REP 743  LAST 1476   22,3517  56 154 1         XCH     MPAC
0024                    22,3520  0 0006 1         EXTEND
0025   REP  26  LAST 1476   22,3521  7 4675 0         MP      HALF
0026   REP 744  LAST 1476   22,3522  20 155 1         DAS     MPAC
0027   REP  68  LAST 1355   22,3523  1 6030 0         TCF     DANZIG          MODE IS ALREADY AT DOUBLE-PRECISION

R0040          READ THE PIPS INTO MPAC WITHOUT CHANGING THEM'

0041                    22,3524  0 0004 0  READPIPS INHINT
0042   REP  13  LAST 1397   22,3525  3 0037 0         CA      PIPAX
0043   REP 745  LAST 1476   22,3526  54 154 0         TS      MPAC
0044   REP   4  LAST 1397   22,3527  3 0040 0         CA      PIPAY
0045   REP 746  LAST 1476   22,3530  54 157 0         TS      MPAC +3
0046   REP   7  LAST 1397   22,3531  3 0041 1         CA      PIPAZ
0047                    22,3532  0 0003 1         RELINT
0048   REP 747  LAST 1476   22,3533  54 161 0         TS      MPAC +5

0049   REP 295  LAST 1476   22,3534  3 4714 1         CAF     ZERO
0050   REP 748  LAST 1476   22,3535  54 155 1         TS      MPAC +1
0051   REP 749  LAST 1476   22,3536  54 160 1         TS      MPAC +4
0052   REP 750  LAST 1476   22,3537  54 162 0         TS      MPAC +6

0053   REP   3  LAST 1152   22,3540  1 6470 0  VECMODE  TCF     VMODE
R0054          FORCE TP SIGN AGREEMENT IN MPAC'

0055   REP  15  LAST 1472   22,3541  0 7226 0  SGNAGREE TC      TPAGREE
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0056   REF  69  LAST 1476   22,3542  1 6030 0            TCF    DANZIG

R0057          CONVERT THE DP 1'S COMPLEMENT ANGLE SCALED IN REVOLUTIONS TO A SINGLE PRECISION 2'S COMPLEMENT ANGLE
R0059  SCALED IN HALF-REVOLUTIONS.

0060   REF   1              22,3543  0 3573 0  1STO2S    TC     1TO2SUB
0061   REF 296  LAST 1476   22,3544  3 4714 1            CAF    ZERO
0062   REF 751  LAST 1476   22,3545  54 155 1            TS     MPAC +1
0063   REF   5  LAST 1122   22,3546  1 6027 0            TCF    NEWMODE

R0064          DO 1STO2S ON A VECTOR OF ANGLES'

0065   REF   2  LAST 1477   22,3547  0 3573 0  V1STO2S   TC     1TO2SUB        ANSWER ARRIVES IN A AND MPAC.

0066   REF 752  LAST 1477   22,3550  52 162 0            DXCH   MPAC +5
0067   REF 753  LAST 1477   22,3551  52 155 1            DXCH   MPAC
0068   REF   3  LAST 1477   22,3552  0 3573 0            TC     1TO2SUB
0069   REF 754  LAST 1477   22,3553  54 156 1            TS     MPAC +2

0070   REF 755  LAST 1477   22,3554  52 160 1            DXCH   MPAC +3
0071   REF 756  LAST 1477   22,3555  52 155 1            DXCH   MPAC
0072   REF   4  LAST 1477   22,3556  0 3573 0            TC     1TO2SUB
0073   REF 757  LAST 1477   22,3557  54 155 1            TS     MPAC +1

0074   REF 758  LAST 1477   22,3560  3 0161 1            CA     MPAC +5
0075   REF 759  LAST 1477   22,3561  54 154 0            TS     MPAC

0076   REF 178  LAST 1468   22,3562  3 4712 1  TPMODE    CAF    ONE            MODE IS TP.
0077   REF   6  LAST 1477   22,3563  1 6027 0            TCF    NEWMODE

R0078          V1STO2S FOR 2 COMPONENT VECTOR. USED BY RR.

0079   REF   5  LAST 1477   22,3564  0 3573 0  2V1STO2S  TC     1TO2SUB
0080   REF 760  LAST 1477   22,3565  52 160 1            DXCH   MPAC +3
0081   REF 761  LAST 1477   22,3566  52 155 1            DXCH   MPAC
0082   REF   6  LAST 1477   22,3567  0 3573 0            TC     1TO2SUB
0083   REF 254  LAST 1473   22,3570  54 001 1            TS     L
0084   REF 762  LAST 1477   22,3571  3 0157 1            CA     MPAC +3
0085   REF   3  LAST 1476   22,3572  1 6024 0            TCF    SLOAD2

R0086          SUBROUTINE TO DO DOUBLING AND 1'S TO 2'S CONVERSION'

0087   REF 763  LAST 1477   22,3573  52 155 1  1TO2SUB   DXCH   MPAC           FINAL MPAC +1 UNSPECIFIED.
0088                        22,3574  20 001 1            DDOUBL
0089   REF 435  LAST 1473   22,3575  10 000 0            CCS    A
0090   REF 179  LAST 1477   22,3576  6 4712 1            AD     ONE
0091                        22,3577  1 3601 1            TCF    +2
0092                        22,3600  4 0000 0            COM                   THIS WAS REVERSE OF MSU.

0093   REF 764  LAST 1477   22,3601  54 154 0            TS     MPAC           AND SKIP ON OVERFLOW.
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0094   REP 365  LAST 1475   22,3602  0 0002 0          TC     Q

0095   REP 436  LAST 1477   22,3603  50 000 1          INDEX  A
0096   REP   8  LAST 1177   22,3604  3 4673 1          CAF    LIMITS
0097   REP 765  LAST 1477   22,3605  26 154 0          ADS    MPAC
0098   REP 366  LAST 1478   22,3606  0 0002 0          TC     Q
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OVERFLOW UNCORRECT AND IN MSU.

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P0099                SUBROUTINE TO INCREMENT CDUS
 0102   REF   1                  22,3607  3 3622 1  INCRCDUS CAF   LOCTHETA
 0103   REF 127  LAST 1338       22,3610  54 130 1           TS    BUF          PLACE ADRES(THETA) IN BUF.
 0104   REF 766  LAST 1478       22,3611  30 154 1           CAE   MPAC         INCREMENT IN 1S COMPL.
 0105   REF   1                  22,3612  0 3623 0           TC    CDUINC

 0106   REF 128  LAST 1479       22,3613  24 130 0           INCR  BUF
 0107   REF 767  LAST 1479       22,3614  30 157 1           CAE   MPAC +3
 0108   REF   2  LAST 1479       22,3615  0 3623 0           TC    CDUINC

 0109   REF 129  LAST 1479       22,3616  24 130 0           INCR  BUF
 0110   REF 768  LAST 1479       22,3617  30 161 1           CAE   MPAC +5
 0111   REF   3  LAST 1479       22,3620  0 3623 0           TC    CDUINC

 0112   REF   1                  22,3621  1 3540 1           TCF   VECMODE

 0113   REF  23  LAST 1392       22,3622   01155 1  LOCTHETA ADRES THETAD

R0114                THE FOLLOWING ROUTINE INCREMENTS IN 2S COMPLEMENT THE REGISTER WHOSE ADDRESS IS IN BUF BY THE 1S COMPL.
R0116   QUANTITY FOUND IN TEM2. THIS MAY BE USED TO INCREMENT DESIRED IMU AND OPTICS CDU ANGLES OR ANY OTHER 2S COMPL.
R0118   (+0 UNEQUAL TO -0) QUANTITY. MAY BE CALLED BY BANKCALL/SWCALL.

 0119   REF   6  LAST 1334       22,3623  54 142 1  CDUINC   TS    TEM2         1S COMPL.QUANT. ARRIVES IN ACC. STORE IT
 0120   REF 130  LAST 1479       22,3624  50 130 0           INDEX BUF
 0121                            22,3625  10 000 0           CCS   0            CHANGE 2S COMPL. ANGLE(IN BUF)INTO 1S
 0122   REF 180  LAST 1477       22,3626  6 4712 1           AD    ONE
 0123                            22,3627  1 3633 0           TCF   +4
 0124   REF 181  LAST 1479       22,3630  6 4712 1           AD    ONE
 0125   REF 182  LAST 1479       22,3631  6 4712 1           AD    ONE          OVERFLOW HERE IF 2S COMPL. IS 180 DEG.
 0126                            22,3632  4 0000 0           COM

 0127   REF   7  LAST 1479       22,3633  6 0142 0           AD    TEM2         SULT MOVES FROM 2ND TO 3D QUAD.(OR BACK)
 0129   REF 437  LAST 1478       22,3634  10 000 0           CCS   A            BACK TO 2S COMPL.
 0130   REF 183  LAST 1479       22,3635  6 4712 1           AD    ONE
 0131                            22,3636  1 3640 1           TCF   +2
 0132                            22,3637  4 0000 0           COM
 0133   REF   8  LAST 1479       22,3640  54 142 1           TS    TEM2         STORE 14BIT QUANTITY WITH PRESENT SIGN
 0134                            22,3641  1 3645 1           TCF   +4
 0135   REF 438  LAST 1479       22,3642  50 000 1           INDEX A             SIGN.
 0137   REF   9  LAST 1478       22,3643  3 4673 1           CAF   LIMITS       FIX IT,BY ADDING IN 37777 OR 40000
 0138   REF   9  LAST 1479       22,3644  6 0142 0           AD    TEM2

 0139   REF 131  LAST 1479       22,3645  50 130 0           INDEX BUF
 0140                            22,3646  54 000 0           TS    0            STORE NEW ANGLE IN 2S COMPLEMENT.
 0141   REF 367  LAST 1478       22,3647  0 0002 0           TC    Q
```

L RTB OP CODES

P0142 RTB TO TORQUE GYROS, EXCEPT FOR THE CALL TO IMUSTALL. ECADR OF COMMANDS ARRIVES IN X1.

```
0144   REP  41  LAST 1294   22,3650  50 120 1  PULSEIMU INDEX  FIXLOC      ADDRESS OF GYRO COMMANDS SHOULD BE IN X1
0145   REP  90  LAST 1344   22,3651  3 0046 0            CA     X1
0146   REP 252  LAST 1470   22,3652  0 4555 0            TC     BANKCALL
0147   REP   6  LAST  714   22,3653   17125 1            CADR   IMUPULSE
0148   REP  70  LAST 1477   22,3654  1 6030 0            TCF    DANZIG
```

P0149 EACH ROUTINE TAKES A 3X3 MATRIX STORED IN DOUBLE PRECISION IN A FIXED AREA OF ERASABLE MEMORY AND REPLACES IT
R0151 WITH THE TRANSPOSE MATRIX. TRANSP1 USES LOCATIONS XNB+0,+1 THROUGH XNB+16D, 17D AND TRANSP2 USES LOCATIONS
R0153 XNB_1+0,+1 THROUGH XNB_1+16D, 17D. EACH MATRIX IS STORED BY ROWS.

```
0154  BSP  14  LAST 1476   22,3655    02713 0  XNBEB     ECADR  XNB
0155  BSP   5  LAST  282   22,3656    02554 1  XNB1EB    ECADR  XNB1

0156  BSP  15  LAST 1481   E5,1713                       EBANK= XNB

0164  BSP   1             22,3657    3 3655 1 TRANSP1  CAF    XNBEB
0165  BSP  68  LAST 1473   22,3660    54 003 0          TS     EBANK
0166  BSP  16  LAST 1481   22,3661    53=716 1          DXCH   XNB +2
0167  BSP  17  LAST 1481   22,3662    53=722 0          DXCH   XNB +6
0168  BSP  18  LAST 1481   22,3663    53=716 1          DXCH   XNB +2

0169  BSP  19  LAST 1481   22,3664    53=720 1          DXCH   XNB +4
0170  BSP  20  LAST 1481   22,3665    53=730 0          DXCH   XNB +12D
0171  BSP  21  LAST 1481   22,3666    53=720 1          DXCH   XNB +4

0172  BSP  22  LAST 1481   22,3667    53=726 1          DXCH   XNB +10D
0173  BSP  23  LAST 1481   22,3670    53=732 1          DXCH   XNB +14D
0174  BSP  24  LAST 1481   22,3671    53=726 1          DXCH   XNB +10D
0175  BSP  71  LAST 1480   22,3672    1 6030 0          TCF    DANZIG
0176  BSP   6  LAST 1481   E5,1554                       EBANK= XNB1

0177  BSP   1             22,3673    3 3656 1 TRANSP2  CAF    XNB1EB
0178  BSP  69  LAST 1481   22,3674    54 003 0          TS     EBANK
0180  BSP   7  LAST 1481   22,3675    53=557 0          DXCH   XNB1 +2
0181  BSP   8  LAST 1481   22,3676    53=563 1          DXCH   XNB1 +6
0182  BSP   9  LAST 1481   22,3677    53=557 0          DXCH   XNB1 +2

0183  BSP  10  LAST 1481   22,3700    53=561 0          DXCH   XNB1 +4
0184  BSP  11  LAST 1481   22,3701    53=571 1          DXCH   XNB1 +12D
0185  BSP  12  LAST 1481   22,3702    53=561 0          DXCH   XNB1 +4

0186  BSP  13  LAST 1481   22,3703    53=567 0          DXCH   XNB1 +10D
0187  BSP  14  LAST 1481   22,3704    53=573 0          DXCH   XNB1 +14D
0188  BSP  15  LAST 1481   22,3705    53=567 0          DXCH   XNB1 +10D
0191  BSP  72  LAST 1481   22,3706    1 6030 0          TCF    DANZIG
```

L RTB OP CODES USER#S PAGE NO. 7 E5 S4

```
P0192            THE SUBROUTINE  SIGNMPAC  SETS C(MPAC, MPAC +1) TO SIGN(MPAC).
R0193   FOR THIS, ONLY THE CONTENTS OF MPAC ARE EXAMINED.    ALSO +0 YIELDS POSMAX AND -0 YIELDS NEGMAX.

R0195   ENTRY MAY BE BY EITHER OF THE FOLLOWING'

R0196   1.       LIMIT THE SIZE OF MPAC ON INTERPRETIVE OVERFLOW'
R0197   ENTRY'          BOVB
R0198                          SIGNMPAC

R0199   2.       GENERATE IN MPAC THE SIGNUM FUNCTION OF MPAC'
R0200   ENTRY'          RTB
R0201                          SIGNMPAC

R0202   IN EITHER CASE, RETURN IS TO  THE NEXT INTERPRETIVE INSTRUCTION IN THE CALLING SEQUENCE.

 0204                          22,3707  0 0006 1  SIGNMPAC EXTEND
 0205   REF   2  LAST  353    22,3710  3 4672 0            DCA    DPOSMAX
 0206   REF 769  LAST 1479    22,3711  52 155 1            DXCH   MPAC
 0207   REF 439  LAST 1479    22,3712  10 000 0            CCS    A
 0208   REF 297  LAST 1477    22,3713  3 4714 1  DPMODE    CAF    ZERO          SETS MPAC +2 TO ZERO IN THE PROCESS
 0209   REF   4  LAST 1477    22,3714  1 6026 1            TCF    SLOAD2 +2
 0210                          22,3715  1 3716 0            TCF    +1
 0211                          22,3716  0 0006 1            EXTEND
 0212   REF   3  LAST 1482    22,3717  4 4672 1            DCS    DPOSMAX
 0213   REF   5  LAST 1482    22,3720  1 6024 0            TCF    SLOAD2

R0214       RTB OP CODE NORMUNIT IS LIKE INTERPRETIVE INSTRUCTION UNIT, EXCEPT THAT IT CAN BE DEPENDED ON NOT TO BLOW
R0216   UP WHEN THE VECTOR BEING UNITIZED IS VERY SMALL -- IT WILL BLOW UP WHEN ALL COMPONENTS ARE ZERO.    IF NORMUNIT
R0218   IS USED AND THE UPPER ORDER HALVES OF ALL COMPONENTS ARE ZERO, THE MAGNITUDE RETURNED IN 36D WILL BE TOO LARGE
R0220   BY A FACTOR OF 2(13) AND THE SQUARED MAGNITUDE RETURNED AT 34D WILL BE TOO BIG BY A FACTOR OF 2(26).

 0222   REF 184  LAST 1479    22,3721  3 4712 1  NORMUNX1 CAF    ONE
 02221  REF   1               22,3722  1 3724 1            TCF    NORMUNIT +1
 02222  REF 298  LAST 1482    22,3723  3 4714 1  NORMUNIT CAF    ZERO
 02223  REF  42  LAST 1480    22,3724  6 0120 1            AD     FIXLOC
 02224  REF 770  LAST 1482    22,3725  54 156 1            TS     MPAC  +2
 02225  REF 253  LAST 1480    22,3726  0 4555 0            TC     BANKCALL      GET SIGN AGREEMENT IN ALL COMPONENTS
 0223   REF   3  LAST 1145    22,3727   01010 1            CADR   VECAGREE
 0224   REF 771  LAST 1482    22,3730  10 154 0            CCS    MPAC
 0225   REF   1               22,3731  1 3765 1            TCF    NOSHIFT
 0226                          22,3732  1 3734 0            TCF    +2
 0227   REF   2  LAST 1482    22,3733  1 3765 1            TCF    NOSHIFT
 0228   REF 772  LAST 1482    22,3734  10 157 0            CCS    MPAC  +3
 0229   REF   3  LAST 1482    22,3735  1 3765 1            TCF    NOSHIFT
 0230                          22,3736  1 3740 0            TCF    +2
 0231   REF   4  LAST 1482    22,3737  1 3765 1            TCF    NOSHIFT
 0232   REF 773  LAST 1482    22,3740  10 161 0            CCS    MPAC  +5
 0233   REF   5  LAST 1482    22,3741  1 3765 1            TCF    NOSHIFT
 0234                          22,3742  1 3744 1            TCF    +2
 0235   REF   6  LAST 1482    22,3743  1 3765 1            TCF    NOSHIFT
```

```
 0236   REF 774  LAST 1482   22,3744  3 0155 0          CA      MPAC  +1      SHIFT ALL COMPONENTS LEFT 13
 0237                        22,3745  0 0006 1          EXTEND
 0238   REF  65  LAST 1449   22,3746  7 4675 0          MP      BIT14
 0239   REF 775  LAST 1483   22,3747  20 155 1          DAS     MPAC          DAS GAINS A LITTLE ACCURACY
 0240   REF 776  LAST 1483   22,3750  3 0160 0          CA      MPAC  +4
 0241                        22,3751  0 0006 1          EXTEND
 02411  REF  86  LAST 1483   22,3752  7 4675 0          MP      BIT14
 02412  REF 777  LAST 1483   22,3753  20 160 1          DAS     MPAC  +3
 02413  REF 778  LAST 1483   22,3754  3 0162 1          CA      MPAC  +6
 02414                       22,3755  0 0006 1          EXTEND
 02415  REF  87  LAST 1483   22,3756  7 4675 0          MP      BIT14
 02416  REF 779  LAST 1483   22,3757  20 162 0          DAS     MPAC  +5
 02417  REF   5  LAST 1145   22,3760  3 4720 0          CAF     THIRTEEN
 02418  REF 780  LAST 1483   22,3761  50 156 0          INDEX   MPAC  +2
 02419                       22,3762  54 045 1          TS      37D
 0242   REF  67  LAST 1468   22,3763  0 4574 0  OFFTUNIT TC      POSTJUMP
 0243   REF   2  LAST 1088   22,3764   01024 0          CADR    UNIT  +1      SKIP THE 'TC VECAGREE' DONE AT UNIT
 02431  REF 299  LAST 1482   22,3765  3 4714 1  NOSHIFT  CAF     ZERO
 02432  REF   1              22,3766  1 3761 0          TCF     OFFTUNIT -2
R0300    RTB  VECSGNAG    ...FORCES SIGN AGREEMENT OF VECTOR IN MPAC.

 0301   REF 254  LAST 1482   22,3767  0 4555 0  VECSGNAG TC      BANKCALL
 0302   REF   4  LAST 1482   22,3770   01010 1          CADR    VECAGREE
 0303   REF  73  LAST 1481   22,3771  0 6030 1          TC      DANZIG
*** END OF SATRAP  .007 ***
```

SYMBOL TABLE LISTING, INCLUDING DEFINITION, HEALTH, PAGE OF DEF, # OF REFS, PAGE OF FIRST REF, PAGE OF LAST REF.

SYMBOL	DEF	H	REFERENCES	SYMBOL	DEF	H	REFERENCES	SYMBOL	DEF	H	REFERENCES
.05G	26,3237	834	1 804	-OCT10	6171	1083	1 1083	=14MS	17,3340	1024	7 1010 1024
.05GBIT	4710	= 57		-ON	40,2334	315	2 314 353	==========			
.05GSW	0146	= 57	4 804 823	-PHASE1	0752	73	6 181 1380	A	0000	= 37	439 80 1482
.166...	23,3430	1331	1 1327	-PHASE2	0754	73	3 181 197	A-PCHK	13,3136	1290	4 1287 1300
.3D	11,3674	1321	1 1292	-PHASE3	0756	73	3 181 526	ABCLOAD	41,2612	337	1 321
.5SEC	4731	1171	9 127 1414	-PHASE4	0760	73	3 181 652	ABLOAD	41,2677	338	1 321
.6SECTS	24,2774	655		-PHASE5	0762	73	4 181 779	ABORT	5604	= 1464	
==========				-PHASE6	0764	73	4 181 1474	ABORT2	5624	1463	1 1463
+DECSGN	40,2204	313	1 313	-ROLL1	4377	= 960	1 958	ABS	00,3226	1151	2 1150
+DOWN	00,2610	1138	1 1137	-ROLL2	16,3740	960	1 958	ABVAL	00,3201	1150	
+LIMIT	42,3252	334	1 334	-SLOPE	16,3730	960	3 953 955	ABVALABS	00,3176	1150	1 1088
+MGA	E7,1625	= 120	9 120 629	-T-3	15,3765	1062	1 1057	ACADN83	24,2402	646	1 647
+ON	40,2314	314	3 314 353	-TORQUE	16,3673	958	1 957	ACADN85	24,2406	646	2 642 644
+ROLL1	4715	= 960	1 958	-TPER	E4,1745	= 89	7 89 514	ACBD2Y	17,3435	1027	1 1027
+ROLL2	4732	= 960	1 958	-UP	00,2620	1138	1 1137	ACBD2Z	17,3500	1028	1 1027
+TORQUE	16,3652	957	1 957	-VM/360K	15,3772	1062	2 1054 1062	ACCEPTUP	07,3626	1417	2 1418
+2ACTDEG	20,2145	687	2 686	-VMT/180	15,3772	= 1062	1 1054	ACCEPTWD	41,2027	318	2 318
==========				-VREL	E7,1525	= 116	3 116 836	ACCOMP	11,2430	1305	1 1313
NBSM	23,3601	1337	1 497	-VT/180	E6,1613	= 110	13 110 1055	ACCWD	E5,1522	= 97	2 433
SMNB	23,3577	1337	5 281 887	-VT/180E	E6,1570	= 111	1 1053	ACORBD	E6,1630	= 107	5 107 1028
==========				-1/KB2	26,3211	834	1 820	ACOS=0	00,3636	1159	4 1159 1161
-AYO	E3,1713	= 84	2 618 1220	-1/12	13,3757	1322	1 1311	ACOSABRT	00,3722	1161	
-BIT10	06,2763	155	1 151	-1/2+2	00,2444	1134	1 1155	ACOSOVF	00,3720	1161	1 1159
-BIT14	7705	1173	2 688 904	-1/8	7710	1173	1 1069	ACOSSHR	00,3713	1161	1 1159
-CCSPR	01,3153	1188	1 1189	-1CHK	43,3271	1365	5 1366 1371	ACOSST	00,3624	1159	1 1159
-CDUT+1	20,3710	1040	1 1039	-15DEGS	06,2506	144	1 143	ACOSST2	00,3641	1159	2 1159
-COMMAX	07,3544	1410	2 1392 1393	-2SEC	10,3677	1462	1 1448	ACOSZERO	00,3726	1161	1 1159
-COMMAX-	07,3545	1410	2 1392 1393	-4ACTDEG	20,2144	687	1 686	ACOS3	00,3651	1160	1 1161
-COSB	E5,1673	= 93	1 93	-50SC	04,3515	1259	1 1247	ACRBDZ	17,3055	1015	2 1015
-DELAIG	E6,1676	= 109	5 109 1042	-6.05DEG	26,3011	764	1 763	ACRJETS	17,3174	1019	2 1014 1027
-DELAMG	E6,1677	= 109	4 109 1042	-70DEGS	06,2505	144	1 143	ACROLL	17,3005	1014	
-DELAOG	E6,1675	= 109	3 109 1042	==========				ACTCENT	E5,1632	= 91	3 91 467
-ELR	05,3166	189	2 185 186	/BUF+	00,2721	1142	2 1141	ACTIVE	22,3376	490	2 464 490
-ENDERAS	7712	1173	1 1080	/BUF-	00,2715	1141	2 1141	ACTLIM	20,3161	937	2 926 931
-ENDVAC	6220	1084	2 1080 1098	/MPAC+	00,2767	1143	2 1143	ACTSAT	20,3413	941	2 937
-ERTHRAT	34,2277	531	1 528	/MPAC-	00,2763	1143	2 1143	ACYCHECK	17,3113	1016	
-FOURDT	17,2002	677	1 676	/NORM	00,2732	1142	1 1142	ACYJETS	17,3210	1020	2 1016 1027
-GYROMIN	07,3322	1402	2 1402 1405	/NORM2	00,2725	1142	1 1142	AC2Y	17,3453	1027	2 1027
-HSCALED	26,3313	835	1 805	==========				ADB	E6,1655	= 108	7 108 1002
-KSCALE	26,3315	835	1 805	=.24	21,2610	986	1 985	ADBVEL	E6,1523	= 106	4 1001 1004
-KVSCALE	37,3671	842	1 836	=+.1SEC	17,3335	1024	5 1021 1028	ADDINDRP	33,3261	437	1 437
-MAXADRS	4364	= 1364	1 1369	=+14MS	21,3034	990	1 987	ADDRESS	6052	1079	
-MAXDELV	37,3135	784	1 782	=-.1SEC	17,3333	1024	3 1021 1024	ADDRWD	0116	67	79 1077 1338
-MUDT(E)	37,3355	790	1 790	=-2	7715	= 1020	4 1015 1028	ADENDEXT	25,3024	817	1 815
-MUDT(M)	37,3357	790		=-4	6061	= 1020	2 1015 1016	ADERCOMP	33,3346	439	

HEALTH KEY' NORMALLY DEFINED UNLESS FLAGGED AS FOLLOWS'

UN UNDEFINED = DEFINED BY EQUALS J DEFINED BY JOKER OR ERASE ANYWHERE MD MULTIPLY DEFINED
BD BADLY DEFINED CD DEFINITION ASSOCIATED WITH CONFLICT XX MISCELLANEOUS TROUBLE